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Battle for the Floodplains:
**An Institutional Analysis of Water Management
and Spatial Planning in England**

Thesis submitted in accordance with the requirements of the



for the
Degree of Doctor in Philosophy

by
Karen Michelle Potter

September 2012

Abstract

Dramatic flood events witnessed from the turn of the century have renewed political attention and, it is believed, created new opportunities for the restoration of functional floodplains to alleviate the impact of flooding on urban development. For centuries, rural and urban landowning interests have dominated floodplains and water management in England, through a 'hegemonic discourse alliance' on land use development and flood defence. More recently, the use of structural flood defences has been attributed to the exacerbation of flood risk in towns and cities, and we are warned if water managers proceeded with 'business as usual' traditional scenarios, this century is predicted to see increased severe inconveniences at best and human catastrophes at worst. The novel, sustainable and integrated policy response is highly dependent upon the planning system, heavily implicated in the loss of floodplains in the past, in finding the land for restoring functioning floodplains. Planners are urged to take this as a golden opportunity to make homes and businesses safer from flood risk, but also to create an environment with green spaces and richer habitats for wildlife. Despite supportive changes in policy, there are few urban floodplain restoration schemes being implemented in practice in England, we remain entrenched in the engineered flood defence approach and the planner's response is deemed inadequate. The key question is whether new discourses and policy instruments on sustainable, integrated water management can be put into practice, or whether they will remain 'lip-service' and cannot be implemented after all. Against the backdrop of a broader modernity debate, in this thesis the English floodplain emerges as a 'battle site' where the planner is caught in the cross fire of an ideological clash between economic (armed with technology) and environmentalist (allied with nature) arguments and preferred change in land use. Furthering interpretative research and discourse analysis to tap and explain belief and knowledge systems rather than rational 'fluvial systems' per se, the thesis delves deeper than previous research, into the mind sets and 'irrationalities' of actors' practices on the floodplain. The policy response advocating 'making space for water' and floodplain restoration is based on an overstretched steering optimism, and will continue to prove too radical if the mediating and tempering political-institutional context is not seriously addressed. If there is true commitment from the UK government, closing the current implementation deficit on floodplain restoration will require the recognition and amelioration of persisting power structures within government agencies, founded on technological and economic rationalities, and permit the planner to share responsibility, unfettered by one sided growth objectives, to find new ways of working across sectors and disciplines towards sustainable, water sensitive towns and cities.

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*In this world there is nothing softer or thinner than water.
But to compel the hard and unyielding, it has no equal.
That the weak overcomes the strong,
that the hard gives way to the gentle –
This everyone knows, yet no one acts accordingly*

Lau-Tzu (6th Century B.C.)

Part I: *Define and Design*

Introduction, Analytical Framework and Methodology

1

Introduction to a Contested Space: the Floodplains of England

“Ministers should be applauded for recognising that there’s simply no way we could tell the thousands of key workers and low income families, desperate for a decent home, that we can’t build any more new homes because of concerns about flood plains” (David Orr, National Housing Federation, BBC News, 2007); *“Gordon Brown has to accept the inconvenient truth that if you build houses on flood plains it increases the likelihood that people will be flooded”* (Eric Pickles, Shadow Communities Secretary, BBC News, 2007); *“Any decision to base many new homes on flood plains will necessitate large spending on flood defences”* (Jill Craig, Royal Institute of Chartered Surveyors, Telegraph, 2007); *“The Government can now react in one of two ways; by creating hard large-scale flood defences or take a different approach to flood management and work with nature. The wildlife trust believes working with nature is vital”* (Colin Preston, Wildlife Trust, Shropshire Star, 2007). July 2007, as waters inundated swaths of central and western England following the wettest May to July since records began in 1766 (EA, 2007), the media was awash with political opinion following the announcement of the government’s ambitious new plans to build three million new homes by 2020 (BBC News, 2007; The Guardian, 2007). Following the launch of the Housing Green Paper ‘Homes for the future: more affordable, more sustainable’, the Labour Government’s Housing Minister Yvette Cooper declared there would have to be a significant increase in house building over the next decade to keep up with demand and, as long as the proper defences were in place, it was inevitable that some of these new homes would be built on floodplains (Telegraph, 2007; Directgov, 2007). In one of the towns worst hit in the July 2007 floods, thousands of residents staged a march through Tewkesbury against the plans to build on floodplains, urging the government to review its policy on such development. Chuck Pavey, town councillor; *“any change has got to come from the top down.....Ministers who say we shouldn’t rule out building on the flood plain should come and live here.....There were over a thousand homes flooded here - many of them brand new”* (BBC News, 2007).

Two Months Earlier....

May 2007, as the heavy rainfall began, my PhD research proposal was submitted to the Economic and Social Research Council (ESRC), ‘to explore the current barriers to floodplain restoration, with a view to realising its potential as a sustainable flood risk management solution’. In quoting Environment Secretary David Miliband (from his speech to the Campaign to Protect Rural England (CPRE)), I demonstrated the realisation of the rising conflict between development needs and flood risk, with the need to build in the idea of ‘environmental limits’ within the planning system (CPRE, 2007). Miliband detailed how our understanding of eco-system services and how we protect natural resources needed to catch up with our understanding of climate change. In putting “*the green back into the Green Belt*”, he gave the example of planting multi-functional urban woodland, to “*provide urban flood control, improved biodiversity and wildlife, renewable wood to offset climate change, and attractive and accessible environments for exercise and recreation*” (*ibid*, p14). He described the benefits of strips of green space alongside urban river banks; “*Rather than building expensive concrete barriers to insulate ourselves from flood risks, we could create what could be called ‘turquoise belts’. If and when the water spills over into the green space, it would not matter. These could be used for leisure and to improve biodiversity. Turquoise belts could be more attractive, more cost-effective and better for the environment*” (*ibid*, p14). Accepting land use would change, Miliband thought it was “*up for grabs*” whether the change ensured environmental, economic and social objectives went “*hand in hand, or at the expense of the other*” (*ibid*, p16). In concluding his speech, Miliband questioned where power and responsibility should lie in improving our green infra-structure, believing that although Government could help to spark a debate, if we were to achieve a more mature, engaged debate, a broad coalition of interests, from citizens and community groups to farmers, developers and local government, *must* be mobilised.

Also writing in 2007 (published 2008), Moss and Monstadt (eds) in their book “Restoring Floodplains in Europe: policy contexts and project experiences”, observed the UK undergoing catastrophic flooding with floodplains receiving considerable, critical media attention. Drawing on their experience of previous flood events, Moss and Monstadt (2008) expected that a disaster of this type would inevitably generate interest in more effective means of minimising the impact of flooding on development. Recent policy shifts, they believed could create renewed attention and new opportunities for the restoration of functional floodplains.

Tracking forward five years, over the time period of the PhD research, to 2012 – was this ‘*window of opportunity*’ taken?

Chapter 1 will continue to outline the shifting policy context for urban floodplains, following the recognition that to persist with engineered flood defences is no longer a sustainable option (1.1). The institutional barriers to one of the novel sustainable policy responses, floodplain restoration, are then described (1.2) including the allegedly inadequate role of the planning system in finding the land for restoring functioning floodplains. The PhD research is situated within the wider context of ‘shifts in governance’, with the call for greater integration and sustainability (1.3), finally the ‘interpretative’ turn of the research is briefly introduced, concluding with an outline of the thesis structure and research questions (1.4).

1.1 The Shifting Policy Context for Urban Floodplains

For centuries, landowning interests have dominated floodplains and water management in England. Across Europe, Blackwell and Maltby (2006) contend approximately 98% of ‘natural’ rivers and their floodplains have been lost due to the development of settlements, industry and agriculture and the consequential need to engineer flood defences to protect the investment now lying vulnerable on the floodplains. Although historically development had taken place above the level of normal, seasonal floods, the wise avoidance of floodplains for development broke down in the 1930s and 1940s as the newly drained land yielded to pressures for housing and industry (Werritty, 2006). A major strategy of engineered flood defences followed in the wake of the great storm and catastrophic floods of 1953 that “invaded” the east coast of England and claimed over 300 lives, said to have invoked the protection of society, its capital and infrastructure against the incursions of wild nature (Adams *et al.*, 2004). Building on floodplains had still been progressing, with planning permission, at a rapid rate in flood-prone areas up until the 1990s, despite the obvious risks, which subsequently required structural mitigation schemes to alleviate the inherited hazard. Many urban streams carrying urban runoff have been lost in their conversion to fenced off, concrete lined, straightened flood conveyance channels, buried and built over in underground culverts, or in what Novotny *et al.* (2010) see as their “ultimate demise”, incorporated into the sewage system (p179).

The Unknown Effects of Development and Flood Defence on the Watershed

Having expended great effort to tame and control rivers and urban streams, in the 1990s and turn of the century, it was recognised that the ‘engineering’ of streams and rivers came at a great cost. The cumulative effect over many decades of river regulation, land drainage and increased imperviousness of urbanisation has impacted on the hydrological and ecological integrity of entire watersheds (Blackwell and Maltby, 2006; Novotny *et al.*, 2010; Ostaficzuk and Ostrowski, 2003). Moreover, frequent and devastating flood events have also been increasingly recognised as direct consequences of established river management and development policies. Systems can operate under normal conditions, but the extreme modifications have adverse effects on the resilience of the urban watershed under extreme events, when increased surface run off leads to an increase in high flows, furthermore, structural flood defences rather than controlling the risk, can exacerbate the flooding problem merely moving the risk up or down stream (Novotny *et al.*, 2010) (see figure 1.1).

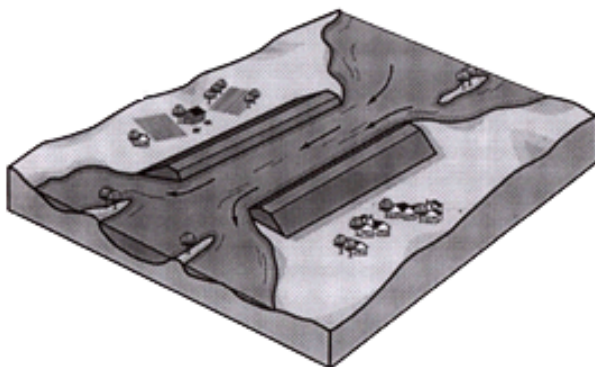


Figure 1.1: The Effects of Engineered Flood Defences on Upstream and Downstream Flood Events

(Source: friendsoftheriver.org)

Consequently, the developed floodplains are highly vulnerable, as flooding events become more frequent, extreme, damaging and costly (Ledoux *et al.*, 2005; Moss and Monstadt, 2008; Novotny *et al.*, 2010; Werrity, 2006). Reduced infiltration and recharge of groundwater aquifers leads to channels with less or even no base flow in times of drought. In addition to low flows, channelisation and other engineering works greatly reduce habitat diversity, hardened banks affecting in-stream and bankside ecology, including fish populations, devastation to trees and ground cover, riverine birds and the continuing decline of the otter (Adams *et al.*, 2004). Rivers disconnected from their

natural floodplains mean they themselves are one of the most threatened ecosystems, with a drastic loss of wetland habitat (Moss and Monstadt, 2008; Novotny *et al.*, 2010).

The wider response in the international literature was for 'Integrated Water Resource Management' (IWRM), defined by the Global Water Partnership as: "the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems". IWRM recognised that in altering one aspect of this natural cycle, there was the probability that other parts of the cycle would be impacted. Thereby, new approaches challenged water managers to work within the natural water system, rather than disrupt it in ways that are "ultimately unsustainable" (CIWEM, 2011, p6). 'Integration' not only referred to the various physical aspects of the water environment, but also to the political and social context, incorporating issues such as energy, greenhouse gas emissions, economics, environmental services and quality of life (*ibid*).

By the turn of the century England experienced a number of catastrophic flood events and the media echoed the academic debate on the impacts of development on the floodplains, the growth in impermeable surfaces and the use of structural defences in exacerbating flood risk (Adams *et al.*, 2004). In 2004 the Foresight Future Flooding report was published, providing a critical analysis of the risks faced in England, particularly due to climate change, over 4 million people and properties valued at over £200 billion were said to be at risk in the country. Under every climate change scenario the report suggested the number of people at high risk from flooding and the expected annual economic damages to properties would increase greatly over the next 30 to 100 years (Evans *et al.*, 2004). With much of the wastewater sewer systems in cities dating from Victorian times, anticipated urban population increase and the need to address climate change, the first half of this century was predicted to see massive investment in the replacement of rapidly deteriorating infrastructure. If water managers proceeded with 'business as usual' traditional scenarios, this century was predicted to "see increased severe inconveniences at best and human catastrophes at worst. Thus, it must be done right" (Novotny *et al.*, 2010, p67).

Floodplain Restoration, 'Turquoise Belts' and 'Daylighting'

With the past 'fast conveyance' river flood defences now thought to be inappropriate and at breaking point, as part of the call for integrated water resource management, there was seen to be an evident need to work with natural processes, including the reconnection of rivers to their natural floodplains to correct the past abuses of their hydrological and ecological functioning (Blackwell and Maltby, 2006; Novotny *et al.*, 2010). Within the European and international policy response, 'More Space for the River', environmentalists called for a paradigm shift in thinking about flood defence and floodplains and wetlands (Scrase & Sheate, 2005) – including floodplain restoration. 'Floodplain restoration' is defined as the "creation of ecosystems typical of floodplains on low lying land which exhibit a hydrological link between river and land" (Adams and Perrow, 1999 in Moss and Monstadt, 2008, p4). Restoration does not necessarily entail reinstating the previous natural state, but to a close approximation of the ecosystem prior to disturbance, in a form of rehabilitation or enhancement of a floodplain's ecological structure, function and behaviour (Moss and Monstadt, 2008; Novotny *et al.*, 2010). Restoring the floodplain in carefully selected areas across the river catchment can reduce the likelihood of flooding to property and development at risk downstream. As described by Blackwell and Maltby (2006) in the EU Ecoflood Guidelines, one of the key hydrological functions performed by floodplains is that of floodwater detention. Water entering a floodplain, either by overbank flow from a river or from surface or sub-surface runoff, is temporarily stored in order to delay and reduce river peak discharge. Reducing the river's peak discharge in turn decreases the probability of the occurrence of floods (p10). As flooding is a natural phenomenon, in addition to reducing flood risk up or downstream, the reconnection of a river with its floodplain achieves multiple environmental, social and economic objectives, such as enhancing the quality of the aquatic biological community and wildlife habitat, the provision of crops and timber, the creation of attractive landscapes and opportunities for leisure and recreational pursuits (Moss and Monstadt, 2008).

Floodplain restoration is commonly perceived as a rural flood risk management solution, yet the situation of urban watercourses, flow limited or buried underground, is also no longer considered sustainable (Novotny *et al.*, 2010). As part of a portfolio of urban 'soft surface approaches' and green infrastructure (green roofs, pervious pavements, rain gardens, rainwater harvesting, vegetation filter strips, biofilter strips),

floodplain restoration and ‘daylighting’ renaturalise the hydrology and ecology of the landscape (Novotny *et al.*, 2010). Setting back development from a watercourse, to restore (or preserve) open vegetated land along a river, ideally most of the floodplain, is known as an ‘urban environmental corridor’, ‘blue corridor or belt’ or to Miliband (see p2) a ‘turquoise belt’ (see figure 1.2).

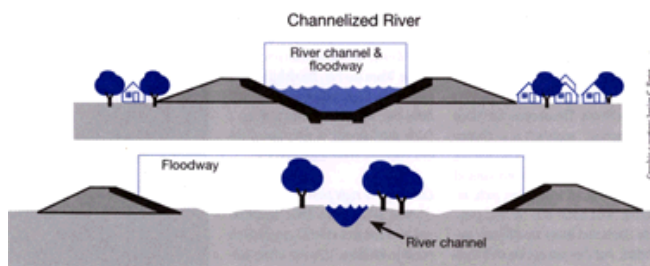


Figure 1.2: Restoration of the Floodplain in the Form of a 'Blue Corridor'

(Source: Blackwell and Maltby, 2006)

Blue corridors convey water in times of flood, and help relieve the pressure on flooding on upstream and downstream locations (Defra, 2008). As well as providing flood storage, these ‘eco-buffer zones’ help protect the receiving water body from the polluting urban area, enhance riparian diversity and can provide attractive walking and cycling paths, picnic areas, playgrounds and other recreational facilities (Wiesner *et al.*, 1982 in Novotny *et al.*, 2010). Urban wetlands enhance flood control, and in addition create an attractive urban and/or suburban landscape, which provides communities with a diverse natural surrounding, thought similar in quality to urban forests (Novotny *et al.*, 2010). As the “kidneys of the nature”, through sedimentation and biological utilization effects, constructed wetlands also remove pollutants from runoff (Mitsch and Gosselink, 2000 in Novotny *et al.*, 2010). ‘Daylighting’ brings buried and highly modified underground culverted streams and rivers back to the surface, re-establishing a waterway as close as possible to its old channel wherever feasible, or else establishing a new channel that threads between buildings, streets and other features of the urban environment (Novotny *et al.*, 2010). Novotny *et al.* (2010) consider high-quality urban water courses, with their environmental integrity maintained, “the greatest architectural assets” of neighbourhoods (p13). Restoration and daylighting in urban areas bring large economic benefits by increasing the quality of the neighbourhood, socially, they “provide a sense of enjoyment, relaxation, opportunities for recreation, and nature education. They bring communities together” (*ibid*, p14). As Sargent (2007) explained, you cannot design flooding out of urban spaces, therefore it is vital that planners and

developers move away from trying to resist increasing seasonal influxes of water and move towards designing for flooding and absorbing excess water safely, including providing storage areas such as wetland habitats and water bodies upstream. “In fact, planners could take this as a golden opportunity to make properties safer, but also improve our environment with green spaces and create richer habitats for wildlife”.

Early Policy Response in Flood Risk Management and Planning

In the wake of the Foresight Future Flooding Report (2004), Defra launched their new strategic document, ‘Making Space for Water’. Whilst recognising the need to focus investment in defences where there was the greatest risk in terms of probability and consequence, the new strategic approach aimed to promote a more holistic, catchment-based approach to the management of rivers and floodplains, achieving multi-functional benefits where possible. In addition to flood warning and flood awareness activities, measures to improve resistance and resilience to flooding, the results of the strategy were anticipated in the form of more flood risk management solutions working with natural processes. More space was to be made for water in the environment through, for example, appropriate use of realignment to widen river corridors and areas of multi-functional wetlands that also would provide a wildlife and recreational resource (Defra, 2005). Flood risk management was to be embedded across a range of Government policies including agriculture and nature conservation and planning (*ibid*). Led by Making Space for Water, policy-makers aimed to improve the operational effectiveness of planning policy (Planning Policy Statement 25), with the strong requirement that current and future flood risk was taken into account at all stages in the planning process.

1.2 Barriers to the Implementation of Floodplain Restoration

Against the backdrop of the “surge of support”, for protecting and restoring floodplains amongst research and policy circles (including the Environment Secretary), Moss and Monstadt (2008) found it astonishing how very few schemes for management realignment and restoring functional floodplains had been put into practice in England, as well as in wider Europe (p4). The majority of restoration projects to that date were limited within the river channel (river restoration), and schemes or projects to restore ecosystems on the floodplain were of a small scale and limited to a few demonstration

sites. Other authors concurred; the practice of floodplain restoration remained in its infancy and was not keeping pace with the policy rhetoric (Adams *et al* 2004; Leroux *et al.*, 2005; Potter, 2006; Werrity, 2006).

Over Complexity of Partnerships and Integration

Reconnecting a river to its floodplain has implications for water and land based institutions, including those related to navigation, agricultural land use, flood defence, nature conservation and urban development (*ibid*). The broad range of stakeholders required to be involved in floodplain restoration projects was alleged to cause over complexity, with the requirements for consultation, large partnerships and combined funding sources from different sources making projects time consuming and costly (Moss, 2007; Moss and Monstadt, 2008). Even within water and flood risk management, flood defence, water quality, conservation and determination of abstraction rates were administered, financed and delivered in an unco-ordinated, highly fragmented, complex framework of various government agencies (Brown and Damery, 2002; Richards and Hughes, 2008). With responsibility for the various aspects of water management oddly disparate and not joined up, Carrington (2007) observes “what are often joined up, but shouldn’t be, are surface drainage channels and sewage drainage, making a real mess when floods happen”.

Traditional Mind Sets

Floodplain restoration was viewed positively by ecologists and conservationists, but the long term impacts of the embryonic ‘flood alleviation’ technique were viewed with scepticism by engineers. They saw it as ‘weakening’ flood control, particularly given the limited experience of large scale schemes (Moss, 2007; Richards and Hughes, 2008). Flood ‘defence’ was considered fundamental to the approach, skill and techniques that had developed within the relevant organisations and in the ideologies of river managers (Adams *et al.*, 2004; CIWEM, 2011; Fox, 2006; Novotny *et al.*, 2010). As policy and operational responsibility remained divided into narrow disciplinary and spatially discrete delivery mechanisms, as a consequence agencies continued to rely almost exclusively on technical engineering solutions and a series of individual, unconnected projects and were only slowly adapting to the sustainability requirements for the future (*ibid*). Converting the political rhetoric into reality was thought to constitute a major challenge, the persistence of traditional attitudes with hard-engineering, site based

solutions and their funding mechanisms, proving substantial constraints to floodplain restoration (Moss, 2007; Novotny *et al.*, 2010; Werrity, 2006). Although pointing to a greening of engineering practice, Werrity (2006) considered only a weak form of sustainable flood management is emerging in England, ‘grafted onto an existing paradigm in which structural solutions are still privileged’ (p22).

Spatial Planning

One of the key institutions, heavily implicated in the loss of floodplains in the past – spatial planning – was considered particularly crucial in finding the land for the creation or restoration of functioning floodplains. In parallel with changes in flood risk management, the Labour Government had conducted a planning reform agenda under the Planning and Compulsory Purchase Act (2004), whereby ‘spatial planning’ was offered a central role in coordinating and enabling the delivery of sustainable communities. The transition from a narrow land use regulatory framework towards a wider concept of spatial planning required effective collaboration with other policy makers and stakeholders who had any interest in the quality of a place (Shaw, 2006), integrating policies for the development and use of land with other policies and programmes which influence the nature of places and how they can function. This meant “moving beyond dealing with what can be built where and in what circumstances”, but also to set out also how social, economic and environmental objectives would be achieved through planning policies (DCLG, 2006). The reformed spatial planning system had the potential, in theory, to play an important integrating role regarding future land use across entire catchment areas, to help maintain or find the space to restore rivers’ natural floodplains as a key component to decreasing flood risk and associated social and economic costs in the UK. Strong opportunities existed for the integration of floodplain restoration into overlapping agendas, for example, through green infrastructure initiatives, mineral site restoration, urban regeneration and/or redevelopment. Floodplain restoration indeed offered a strong response to meeting the Government’s sustainable communities agenda and the challenge faced by the planning community in tackling adaptation to climate change.

Yet the restricted connectivity between land-use planning and sustainable water management policy has been identified as one of the significant constraints to the implementation of floodplain restoration (Moss and Mondstadt, 2008). The

Government's stated position, to build homes more quickly in the opening paragraph, by unblocking the planning system and releasing land for development, appeared to be not just discordant with the people of Tewkesbury, but with the international movement on integrated water management. The Government Department for Communities and Local Government (DCLG), responsible for planning, updated policy on flood risk in 2006 with Planning Policy Statement (PPS25), to ensure a pragmatic approach in considering the impact of flood risk in all levels in the planning process. Although Moss and Monstadt (2008) thought the new Planning Policy Statement marked a major step towards protecting existing functional floodplains from further encroachment (lessons learned following floods in 2000), he saw the policy as "unlikely to offer any significant opportunities for changing land use forms to the benefit of floodplain creation" (p138). Blue corridors were a key urban flood risk management response in 'Making Space for Water', but Defra knew that in order to make them a reality, there would need to be a close integration between planners and flood managers over many decades, but they did not have a clear understanding of the precise actions that would be needed to achieve this (Defra, 2008). Whilst actors in the water sector alleged the involvement of a broad range of stakeholders required to be involved in floodplain restoration projects resulted in over complexity, Shaw (2006) believed that it was the wider involvement of so many other stakeholders in the spatial planning process that made culture change in planning so complicated and challenging. "In an increasingly complex and interconnected world, spatial plans should not be developed in isolated, functional or spatial silos. It may be easy to have such ideas, but much more difficult to operationalise them" (Shaw, 2006).

1.3 'Shifts in Governance'

Many authors in the international social science community had observed this changing nature and topography of a new environmental (and broader) politics, as detailed in the flood risk management sector, 'a shift in governance', to bring the capacity and legitimacy to deal with environmental issues (Hajer and Wagenaar, 2003; Leroy and Arts, 2006). There had been a striking change in vocabulary use from the 1990s, whereby terms such as 'governance', 'partnership', 'integration', 'multi-sector', 'multi-actor' and 'multi-level' had increasingly dominated the policy debate, all falling under the discursive umbrella of 'sustainability' and 'sustainable development' (Arts and Leroy,

2006; Crabbé and Leroy, 2008; Hajer and Wagenaar, 2003). In the same time frame, terms such as ‘the state’, ‘government’, ‘power’ and ‘authority’, ‘participation’ and ‘interest groups’ had “lost their grip on the analytical imagination” (Hajer and Wagenaar, 2003, p1). Hajer and Wagenaar acknowledged the new vocabularies may have signified no more than a change of rhetoric, but hypothesised that such an explanation was too simple. Although the environmental policy field was still relatively young, it had constantly been challenged with new issues and developments, including air pollution during the 1970s, to acidification in the 1980s and then increasing flood risk and climate change this century. By their very nature, the more recently emerging environmental concerns were likely to require a response that did not fit in with the traditional, ‘old style’ policy tradition or policy context (Crabbé and Leroy, 2008). Hajer (1995) viewed environmental politics as the site where the established institutions of an industrial society were put to the test, or in other words, “we witness institutional challenges here that ask for institutional responses” (Crabbé and Leroy, 2008, p20).

Institutional Complexity and Resulting Policy Implementation Deficits

Although observations on ‘shifts in governance’ are well documented (see chapter 2, section 2.1), it is also acknowledged that this not a simple evolutionary process. Despite the early suggestions that these new patterns of governance would provide more steering capacity than their ‘government’ predecessors, as with floodplain restoration, issues and concerns had been raised over wider policies’ effectiveness, efficiency and legitimacy in tackling environmental issues (Crabbé and Leroy, 2008; Leroy and Arts, 2006). In particular, new shared responsibilities across different policy domains raised questions regarding effective policy coordination and integration. With different agencies participating under different rule systems, with the potential for varying definitions of the problem, the result could often mean the use of different approaches and possibly conflicting strategies. In addition, rather than being driven by a common desire to solve environmental problems, a whole array of alternative ‘irrational’ factors can come into play in both policy making and implementation, including power imbalances and, if actors are not in favour of a new policy action, the maintenance of traditional policy arrangements (Crabbé and Leroy, 2008). This institutional complexity had also been observed in water and land management, in short, it was the very same human activities (and human mindsets) that contributed to the loss of functional floodplains in the past and consequent rise in flood risk, that now hindered the

implementation of ‘making space for water’ and floodplain restoration (Brown and Damery, 2002; Handmer 1997; Moss and Monstadt, 2008; Parker and Handmer 1992; SCA 1998). Essentially, with the lack of institutional capacity, the result was an ‘implementation deficit’ between policy ambition and actual policy performance (Crabbé and Leroy, 2008). The key question posed by Leroy and Arts (2006) was whether the new ideas and policy instruments could be put into practice, or whether they would remain “lip-service and cannot be implemented after all”.

The Restricted Scope of Technocratic and Positivist Policy-Making

This common-sense actuality, that environmental policy-making unfolds in a pre-set political and institutional context, is a perspective largely neglected by policy scientists, and indeed policy practitioners (Crabbé and Leroy, 2008; Leroy and Arts, 2006). As section 1.2 detailed, policy prescriptions for restoring rivers’ natural floodplains face complex institutional challenges to implementing the necessary land use change, yet although it is the institutional context that poses such complexity, Moss and Monstadt (2008) assert that surprisingly little is known about the institutional dimensions of floodplain restoration. Mainstream environmental policy-making has an instrumental orientation driven mainly by a means of ‘rationally’ tackling problems, strongly influenced by economic thought. The best possible solutions, that is, the most effective and efficient, are sought on the basis of scientific methods (Crabbé and Leroy, 2008; Hajer 1997). As will be traced in further detail in chapters 4 and 5, but can already be identified in this introductory chapter, the literature on floodplain restoration is authored by ecologists, geographers, geomorphologists and, occasionally, engineers. A number of papers tackle the valuation of ‘ecosystem services’ provided by floodplains and/or wetlands in order to ‘justify’ their wider implementation to traditional water managers (Duffield, 1994; Turner, 1991). Yet although natural scientists are aware of and widely quote the institutional challenges, as evidenced in the opening sections of the chapter, they remain unaddressed by these disciplines, who persist with various ecological and geomorphological challenges of floodplain restoration (Adams *et al.*, 2004; Blackwell and Maltby, 2006; Fox, 2006; Ledoux *et al.*, 2005; Ostaficzuk and Ostrowski, 2003; Richards and Hughes, 2008; Wiesner *et al.*, 1982; Werritty, 2006). A mainstream water management author’s (who are predominantly engineers) ‘institutional’ challenge centres on objections of nearby residents, resistance from other public bodies, maintenance, liability and other technical challenges (such as existing

underground infrastructure and utilities, soil suitability, land contamination). Although it must be said, the flood risk management ‘rational’ challenges of an engineer on the whole bypass the floodplain restoration debate, illustrated by the following quote held back from the opening sequence of this chapter. The New Civil Engineer (2007) waded into the debate following the summer 2007 floods, “*building on brownfield sites, often on flood plains, presents housing developers with a dilemma – how to create foundations that will stand the test of time*” (ICE, 2007).

The research and policy orientation in the environmental sciences, Crabbé and Leroy (2008) contend, is an idealistic distortion that does not do justice to the complexities of an institutional and political context where actors are often guided or constrained by considerations other than those that are rational and goal orientated. The assumption that rational, predictable and hence ‘manageable’ individuals, organisations and societies exist, Arts and Van Tatenhove (2006) also believe, should be questioned. If policy analysts remain caught within the domains of their own discipline, persisting in their synoptic-rational models, their proclaimed policy changes can easily lead to an overstretched steering optimism and prove too radical if the mediating and tempering political-institutional context is not seriously addressed (Arts and Leroy; Arts and Van Tatenhove, 2006). Hajer (1997) also believes that the environmental conflict simply has too many component parts to be understandable if one limits oneself to one of the many established academic domains. He argues that research should be opened up for insights and ideas from an array of disciplines including the sociology of science, sociology of risk, policy analysis, human geography, anthropology, and political science. Social science expertise, specifically, is known to be under represented in environmental policy evaluation (Crabbé and Leroy, 2008).

Connecting Institutional Research to Natural and Engineering Science

For the environmental policy arena of focus, floodplain restoration, the UK ‘social science’ focus is dominated by public engagement studies in river restoration, often authored by natural scientists practicing in this field. Adams and Perrow (1999), Adams *et al* (2004), Hodge and McNally (2000) however have documented the ‘competing discourses’ of floodplain restoration, in a mainly rural context and Ivan Scrase (2005) took a social constructivist perspective on the framing of flood defence as part of his PhD thesis. In terms of a contribution to institutional research, Wiering and Crabbé

(2006) analysed national level water policy arrangements in the Netherlands and Flanders. They stated by that if they had chosen underlying aggregation levels, e.g. only water quality issues or only flooding management, they could have achieved far more detail in their study. Moss and Monstadt (2008), following their recognition and assertion on the lack of institutional research, have made a substantial contribution to research on floodplain restoration from this perspective, completing a systematic analysis of the policy contexts of floodplain restoration schemes in different European countries, including England. Their work aimed to fill the gap on the institutional drivers and constraints of floodplain restoration, to explain why so few projects have been successfully implemented, to recap, highlighting the complexity of partnerships and policy integration, particularly the restricted connectivity between land-use planning and sustainable water management policy. However, Moss and Monstadt concluded that we still need further research on improving cross sectoral coordination, and furthermore, “seeking ways of linking these research tasks to those of the natural and engineering science communities is perhaps the most challenging” (p336).

1.4 My River is Wide, not Deep – Summarising the Research

Following the increase in catastrophic flood events from the 1990s a discursive renewal can be detected in the water policy domain from ‘flood defence’ to ‘flood risk management’. In common with the wider environmental policy domain, this renewal in the discourse calls for a more ‘sustainable’ approach and emphasises the need to share responsibility and integrate with other agencies, across multiple sectors. This change in discourse is exemplified by ‘floodplain restoration’, that is the call to restore naturally functioning floodplains as opposed to keeping water separate from land by building traditional, engineered flood defences. Partnership and integration is essential, spatial planners being a critical new stakeholder in finding the land at a catchment scale. Yet it is the complexity of the involvement of so many stakeholders that is seen as a critical constraint on the successful implementation of floodplain restoration (Ledoux, 2005; Moss and Monstadt, 2008). Despite supportive changes in policy, there were few schemes being implemented in practice in England and furthermore it is claimed we remain entrenched in the flood defence approach. Closing the current implementation deficit will mean finding new ways of working across sectors and spatial scales, yet current analytical perspectives underplay institutional features.

For the social scientist, Luker (2008), knowledge comes not from mastering esoteric facts or techniques, but in making connections across traditional boundaries – “going wide rather than deep” (p60). Although there can be pitfalls in cross-disciplinary research (wide, not deep), the PhD research has mixed varying perspectives from disciplines involved with water management (geography, ecology, hydrology and engineering) with the discipline on the landward side of the floodplain (spatial planning). In a complete departure from the ‘rational’ science perspective, the policy implementation deficit for floodplain restoration will be analysed through an evaluation framework developed within the tradition of interpretative policy analysis.

An Interpretative Analysis

The changes in the English water management and planning sectors, and the barriers faced in realising the change resonate strongly with the broader ‘modernity’ debate. Section 1.3 positions the PhD research on floodplain restoration, with its call for more sustainable ‘holistic’ practices, integration and partnership working, against this background context of an important change in wider international policy domains that have emerged in the past two decades; a shift from ‘government’ to ‘governance’.

The ability to make connections between ‘shifts in governance’ and actor’s activities influencing land use change on the floodplain cannot proceed without ‘theoretical scaffolding’. Interpretive approaches have been experiencing renewed interest in the social sciences. Interpretive policy analysts believe their critical approach and sensitivity to relevant political and historical context is increasingly challenging the empiricist and positivist mainstream research that has dominated recent decades (Feindt, 2011). Interpretative analysis is being used to enhance our understanding of new forms of governance and is being used to clarify issues and enhance participatory approaches to the highly contested discourse on ‘sustainable development’ (*ibid*). A series of social constructivist approaches have begun to place relevance on discourses in environmental policy making, and the relationship of discourse to power in shedding new light on the functioning of institutions (Feindt, 2011; Hajer, 1997). ‘Foucauldian’ approaches place an emphasis on the structuring character of hegemonic discourses, whereby environmental policies are said to be based on longstanding coalitions and relative stability of belief and knowledge systems (Sabatier and Jenkins-Smith, 1993 in Leroy and Arts, 2006). Hajer and Wagenaar (2003) feel this tradition has a much wider relevance

and promotes a much more subtle understanding of contemporary politics and policy making, but to date has been under appreciated. Chapters 2 and 3 will draw on this much broader perspective than current research and policy analysis, to understand change and stability within the policy context of flood risk management and the practice of floodplain restoration specifically.

Spatial Planning - The restricted connectivity between land-use planning and sustainable water management policy has been identified as one of the significant constraints to the implementation of floodplain restoration (Moss and Monstadt, 2008). As there is a considerable ‘inbuilt’ inertia in planning and development, if policy directs a change in land use on floodplains and river corridors, it will take decades for changes to take effect – planning policies must be put in place now (Moss and Monstadt, 2008; Novotny *et al.*, 2010). Kidd and Shaw (2007) have also noted in general policy terms, that although the concept of ‘integration’ had been fundamental in sustainability debates for several years, and it has been recognised that integration is an essential feature of spatial planning; a thorough understanding of the complexity of actually achieving integration, both in theory and practice, is not yet complete (Kidd and Shaw, 2007).

Urban Floodplains- The literature on floodplain restoration has a predominantly rural and agricultural focus. The world’s population is predominantly urban, and the United Nations predict that the total world urban population is projected to double by 2050; the millennium ecosystem goals will be won or lost in cities” (United Nations Habitat, 2006). ‘Hydrology’ is prominent among urban ecological processes, which affects a whole a suite of biophysical, cultural, and ecological processes (Novotny *et al.*, 2010). In fact water is postulated as the “tail that wags the dog” of urban sustainability and resilience (Novotny *et al.*, 2010, p185). Fitting with the focus on spatial planning, taking ecological restoration as the ideal state, this thesis assumes a wider analysis of the contested floodplain space. Although Environment Minister, Miliband’s ideology appeared aligned in 2007, there were other powerful, invested interests involved. The research concentrates on activities of the actors on the urban floodplain, to see how far they have progressed to address flood risk management in an integrated and sustainable way to 2012.

Mind Set - Other than the work by Scrase (2006) on flood defence, ‘mind set’, commonly cited as a barrier to floodplain restoration, receives little attention in the literature. Moss

and Monstadt (2008) observe that the everyday practices and mindsets of key stakeholders regarding floodplain restoration is perhaps the most severe constraint and certainly proves the hardest to change. Richards and Hughes (2008) believe a resolution of the conflict between opposing disciplinary views is required before restoration initiatives become institutionally acceptable goals. Hence, using interpretative research and discourse analysis to tap and explain belief and knowledge systems rather than ‘fluvial systems’ per se, the research will delve deeper than previous research, into the mind sets and ‘irrationalities’ of actors’ practices on the floodplain.

Aim of the Research

To analyse the policy context of urban floodplain restoration, to evaluate if this emerging integrated and, more sustainable solution has become a mainstream practice for water managers and spatial planners to date. In other words, was the ‘window of opportunity’ taken following recent policy shifts and the catastrophic summer floods of 2007? If not, the research aims to make a contribution from an ‘interpretative’ angle, to identify and interpret institutional ‘bottlenecks’ and thereby aid the closure of the policy implementation deficit for floodplain restoration. Or can we surmise the change in discourse in the water sector, with new ideas on governance and policy instruments, is rhetoric or ‘lip service’, and will merely filter away to leave a lasting stability in the traditional flood defence approach?

The aim will be translated to the form of research questions, at the end of the ‘set up’ information of Part I, in the light of the interpretative methodology and theoretical framework (see section 3.5).

Structure of the Thesis

Part I - Define and Design

Chapter 1 has given an explanation for the interpretivist approach to the research, to complement and shed further light on the predominant rational scientists’ view – to investigate the policy implementation deficit of floodplain restoration as an ‘institutional phenomenon’. Following such divergent theoretical positions on policy evaluation, a wide variety of methodological approaches have evolved for answering policy evaluation questions. What follows in **Chapter 2** are further details on the epistemological

position and theoretical assumptions of the research, and the chart of decision making that directed the subsequent research process. The chapter details the research design and methodology, whereby case study research serves to give insight into the way in which ‘shifts in governance’ have affected the policy and practice of restoring floodplains in England. Having briefly introduced the main concepts that underpin the research on institutional barriers or ‘bottlenecks’ to floodplain restoration, **Chapter 3** is devoted to the development of the discourse-analytical framework, underpinned by the theory of institutionalism and in the context of wider ‘shifts in governance’ in the environmental policy domain.

Part II Description and Characterisation

In the initial stage of the empirical research, **Chapters 4 to 6** undertake a longitudinal, historic discourse analysis, to study the phenomenon of interest in England, and analyse how knowledge and ideologies have changed (or remained stable) for the key actors on floodplain activities over time. **Chapter 4** examines the historical roots and institutionalisation of the ‘flood defence’ discourse, **Chapter 5** takes up the historical discourse analysis from the 1980s, with the global rise of environmentalism, and the circumstances from which, and from who and where, the new discourse of floodplain restoration has emerged. **Chapter 6** tracks the discourse ‘live’ during the course of the PhD research, from 2007 to 2012, to ascertain if the ‘window of opportunity’ was taken following the 2007 summer floods, under the renewed attention for the restoration of functional floodplains. Media quotes provide the backdrop to the historical narrative, to provide the public and political framing to the debate.

Part III Interpretation, Prescription and Reflection

In **Chapter 7** the dynamics of the new discourse on floodplain restoration will be examined to investigate, by 2012, to what extent the new ‘discourse’ or policy rhetoric on floodplain restoration has been taken up in practice and ‘if’ the policy implementation deficit still persists, will evaluate the forces for change, and the circumstances in which floodplain restoration could become a mainstream approach (institutionalise) and have an impact on future flood risk management practice. **Chapter 8** will reflect upon the contribution of the interpretivist research undertaken, and contrasting with best practice ‘rational’ findings, will suggest prescriptive solutions

and recommendations to how we can work better together across the disciplines to facilitate the implementation of floodplain restoration. Finally Chapter 8 will also report upon my plans for future research. Figure 1.3 outlines the full thesis chapter structure.

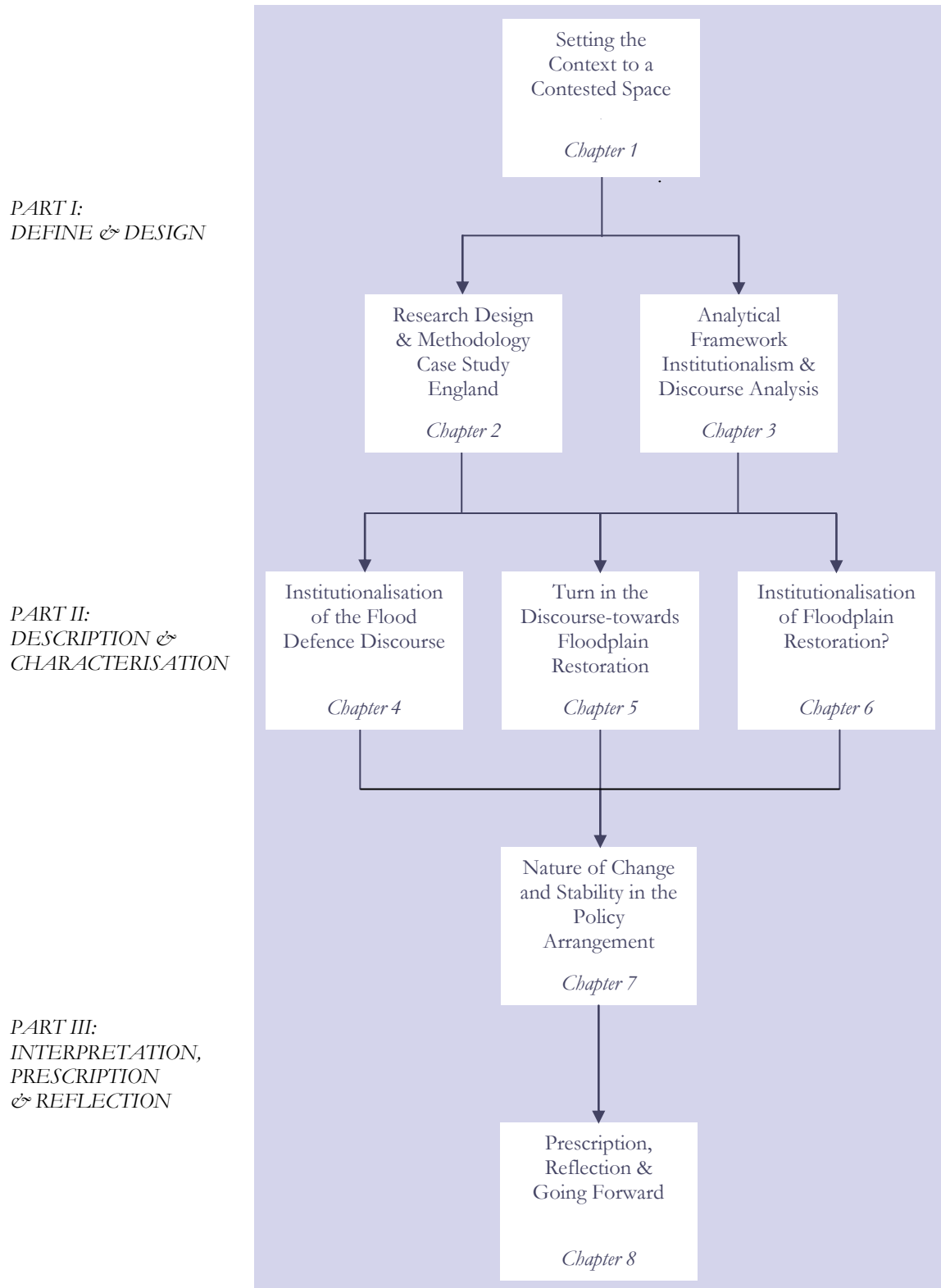


Figure 1.3: Thesis Chapter Structure

2

Methodology: Laying Bare the Bottlenecks in Floodplain Restoration Policy

A wide variety of methodological approaches have evolved for answering policy evaluation questions, although the fact that policy unfolds in a pre-set institutional context is considered to be a somewhat neglected issue by researchers from the interpretivist paradigm. In contrast to the ‘rational’ research paradigm associated with floodplain restoration and water management more broadly, Chapter 2 thus sets out the thesis’ methodological influence from the social science ‘interpretivist’ researchers and outlines the decision making that directed the subsequent research process, to show how the interplay between structural processes of political modernisation and day to day policy making has been studied in the empirical research. Section 2.1 contains further details on the epistemological position and theoretical assumptions of the research. Section 2.2 provides an overall summary of the four broad iterative stages of the research: how the initial stage of ‘grounded’ field work led to the reformulation of the research questions; induced the initial theoretical constructs; followed on to progressively more focused data collection whereby the list of theoretical constructs were explored, tested and developed with both existing and new data. The choice and description of, the qualitative, case study research design is documented in section 2.3. Sections 2.4 and 2.5 then provide further information on data collection and analysis respectively. Data collection methods were triangulated, including the use of documents, focus group and interviews, observation and participatory observation. The data was analysed using theoretical ‘*a priori*’ coding techniques, assisted by the qualitative data analysis program, NVivo. Finally, section 2.6 reports on the endeavour for research quality, including reflexivity, transparency, validity, ethical issues and ends with a claim for research originality.

2.1 Influences: a Critical Approach within the Interpretivist Paradigm

In common with most researchers within the interpretivist tradition, this research has sought to describe and illuminate the ‘meaningful social world’ through qualitative methodologies, rather than the quantitative mathematical treatment of data more associated with positivist research (Silverman, 1993). As Silverman (1993) complains, the social sciences have “been bedevilled by the adoption of misleading polarities” (p26). Much play has been made in distinguishing between two schools of social science that are associated with different versions of research: positivism which seeks to test correlations between variables, and interpretive social science where variables cannot readily be identified or measured and instead the emphasis is on exploration and insight (Cryer, 2006; Silverman, 1993). Although the two schools can often be described as polar opposites, Silverman (1993) maintains that there should be no need to make a choice on principled grounds to be quantitative or qualitative; “it depends upon what you are trying to do.....methodologies cannot be true or false, just more or less useful” (p22). As qualitative research set in the interpretivist research paradigm can answer questions about how and why something is happening and, perhaps more importantly in this case, it can also address questions about what is likely to happen in the future (Cryer, 2006).

In addition to locating my research within the interpretivist paradigm, to put somewhat simplistically, I am interested in what Luker (2008) terms “public” social sciences, by which she means “a theoretically informed, rigorous social science that permits itself to explore the big questions that beset society” (p17). I have an “explanandum”—a puzzle, paradox, or conundrum about a policy implementation deficit for which there is no ready answer and wish to explore models of the social world to offer explanations for this (Luker, 2008). The research is ‘critical’ in that as well as asking questions that have important implications for society, the questions are asked in a way that assumes that at least part of the problem is that the way the questions are traditionally asked is problematic in itself (Luker, 2008). It is not my intention to critique the natural science body of work, but to complement. The light is currently being shone from one side of the research problem; I intend to look in the shadows of institutions to provide insight and recommendations to supplement mainstream research and policy making.

2.2 Four Stage Research Design

The purpose of the research design is to ensure that the correct type of evidence is collected, linked to the initial research questions and enables the research questions to be answered as unambiguously and convincingly as possible (De Vaus, 2001; Yin, 2003). A well-defined empirical methodology for an institutional analysis does not exist (Wodak and Meyer, 2009). As Luker (2008) describes, social science ‘methods’ can provide “a set of guidelines about how to conceptualize and execute a systematic and rigorous intellectual inquiry into something that lets you get as close to the ‘truth’ as possible”. The theoretical constructs, shifts in governance, institutionalism and critical discourse analysis (presented in more detail in Chapter 3) are not arbitrarily chosen. They are the result of 4 years research which can be summarised in four broad iterative stages: literature review and ‘grounded’ observation; development of the theoretical constructs and evaluation framework; theoretical sampling and coding based on the constructs and framework and lastly, a return to the literature to refine the research concerns and theory. As is common with research from the interpretative paradigm, the stages were not followed consistently from theory to collection of discursive texts and onto analysis (Wodak and Meyer, 2009). For example, data collection was not completed before analysis began; the analysis often led to further ‘theoretical’ sampling. New questions arose in the analysis, which meant a return to the theory, sometimes a collection of new data and/or a re-examination of earlier data (see figure 2.1).

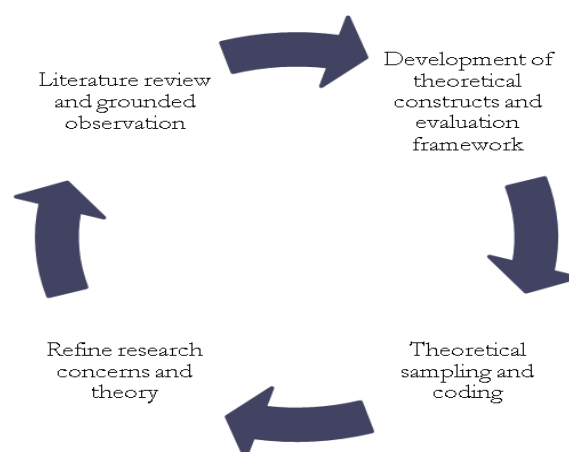


Figure 2.1: Four Stage Iterative Research Design

Stage 1: Literature Review and ‘Grounded’ Observation

In common with much qualitative research, my PhD had commenced with a vaguely defined question; why is there a persistent implementation gap between policy and practice in floodplain restoration? To establish my direction, the first stage of the research commenced with the well-established practice of reviewing what is already known on the subject and methods other researchers have used, complemented with exploratory discussions and interviews with relevant participants in the flooding policy field (Bazeley, 2007). It was, however, initial field observations coupled with reflection on previous practical experience (as an Environmental Planning Officer ‘attempting’ to implement floodplain restoration schemes in partnership) that my thinking about the research concern changed considerably. My study in fact matched the characteristic ‘funnel’ structure of observational research with the added dimension and complication of transcending disciplines; “it is frequently only over the course of the research that one discovers what the research is really ‘about’, and it is not uncommon for it to turn out to be about something quite remote from the initially foreshadowed problems” (Hammersley, 1983 in Silverman, 1993, p46). Please see stage 2.

Stage 2: Development of the Theoretical Constructs and Evaluation Framework

It was only after collecting initial data that I recognised how certain concepts and theories in the social sciences and political sciences literature, namely institutionalism and critical discourse analysis, made perfect sense of the observed emerging themes. ‘Theory’, as defined by Silverman (1993), is a set of explanatory concepts offering ways of looking at the world and which are essential in defining a research problem. Field research has had considerable time to develop and build cumulative bodies of knowledge; therefore hypothesis testing based upon these agreed concepts is not only practical but often desirable (*ibid*). My original ‘rationally’ based research questions were refined in a departure from the ‘rational’ and technocratic’ based literature in flood policy. Chapter 3 will detail the alternative theoretical constructs that were developed.

Stage 3: Theoretical Sampling and Coding

Auerbach (2003) describes theoretical sampling as the process of choosing a research sample in order to extend and refine a theory (p92). ‘Texts’ appropriate to the object of research were collected and analysed, whereby the theoretical constructs were

systematically tested in the ‘real life’ situation of flooding policy in England (De Vaus, 2001). As De Vaus (2001) explains, “if the theory is true, then certain things should follow in the real world” (p6). It is possible that discourse analysis and institutionalism could provide insight into the policy implementation deficit in floodplain restoration. The subsequent stages of data collection and analysis were more deliberative, by the process of theoretical sampling, new documentation and observational locations were selected with the purpose of coding to confirm, elaborate and refine the theory. Further detail on the data collection techniques are provided in section 2.4.

‘Coding’ is a procedure for organizing the text of the transcripts, and discovering patterns within that organisational structure that you couldn’t otherwise see immediately in “the massive amount of text that you are faced with when you begin to analyze your transcripts” (Auerbach, 2003, p32). Theoretical coding, also known as ‘elaborative’ or ‘*a priori*’ coding, is the process of analyzing textual data in order to develop theory further (*ibid*). It operates in a ‘top-down’ fashion, whereby relevant text is selected with the theoretical constructs in mind; it develops themes and repeating ideas that ‘flesh out’ the constructs, to validate and elaborate upon the body of work of previous researchers following this tradition (*ibid*). (This contrasts with ‘bottom-up’ coding, as per grounded theory, where relevant text is selected and coded without preconceived ideas in mind). The full coding process, and the use of the NVivo program, is described in section 2.5.

Stage 4: Refine Research Concerns and Theory

The initial constructs developed in stage 2 served as a guide for testing and developing data, which helped to shed further light on the research phenomenon. However, as Auerbach (2003) and Bazeley (2007) state, the constructs do not usually apply automatically and it was noted “while having a list of a priori codes can be useful....it can confine your reading of the text, and so the advice is to ‘hang loose’, feel free to change or develop what you have set up, as you delve into the data” (Bazeley, 2007, p76). Consequently stage 4’s return to the literature also had the aim of refining and defining more constructs, it allowed the meaning of the data to be explored, extended and developed further; “it is important to let the data speak for itself as much as possible” (Bazeley, 2007). Stage 4 is also described in section 2.5.

2.3 Overall Research Approach: the Case Study

It is the form of the research question that leads to the first important clue for differentiation in a choice of various research designs (Yin, 2003). According to Yin (2003), ‘what’, ‘how many’ and ‘how much’ type questions are likely to be exploratory and favour survey or archival strategies to quantify frequency or incidence. In contrast ‘how’ and ‘why’ questions tend to be more explanatory and likely to lead to the use of case studies, histories and experiments. The initial research questions were raised in the introductory chapter (and further developed at the end of chapter 3); they concern predominantly ‘how’ and ‘why’ questions. Therefore, following Yin (2003), the research design would favour an experiment, history or case study approach. The distinction and choice between these designs concern the control over behavioural events and degree of focus on contemporary as opposed to historical events (Yin, 2003). In researching the phenomena of a policy implementation deficit in floodplain restoration, unlike performing an experiment, I cannot manipulate behaviour directly, precisely and systematically, I am asking questions about a set of events over which I have no control (Yin, 2003). The first stage of the empirical research (how and why has the new discourse on flood risk management and floodplain restoration emerged?) will rely on archival documents in tracing the history of flooding policy. In the remaining research questions I am dealing with contemporary events, and not exclusively a ‘dead’ past when relevant persons are not alive to interview or observe (Yin, 2003). As is well quoted, it is the case study approach that investigates a contemporary phenomenon within its real-life context, and notably, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2003, p13). Other research design approaches focus on variables, which are often not considered within their context. In wrenching traits out of the context in which they occur, De Vaus (2001) believes we strip them of much of their meaning and significance and consequently risk misunderstanding their causes. Only “the in-depth case study” can provide an understanding of the important aspects of a new or persistently problematic research area (Punch, 2005, p147).

Case Study – to Aim for a More Holistic and Meaningful Explanation

As both De Vaus (2001) and Yin (2003) explain, case study designs seek to achieve more complex and fuller explanations of social phenomena, retaining the holistic and meaningful characteristics of real-life events. It enables the object or phenomena under

study to be viewed holistically and comprehensively and be studied in its complexity. Furthermore, it is noted by Crabbé and Leroy (2008) in relation to environmental policy evaluation specifically, that case study research designs are often used and when chosen carefully they believe a small number of cases, or even a single case, can be very revealing of the core issues in a policy field and the critical paths of certain implementation processes. This research design can “succeed excellently in laying bare bottlenecks in policy making, policy implementation and its actual effects, and may therefore result in a sound and valuable policy evaluation” (*ibid*, p41). The form of the design has involved qualitative research; thus further enhancing the potential of allowing the ‘truth’ about human social behaviour to be told dependent of context (Punch, 2005).

Unit of Analysis: the Policy Arrangement of Flood Risk Management

A ‘case’ is the object of study and the ‘unit of analysis’ about which information is collected (De Vaus, 2001). This does of course entail defining what the ‘case’ is, which Yin (2003) recognises as a fundamental problem that has plagued many investigators at the outset of case studies. Miles and Huberman (1994) define a case as a phenomenon of some sort occurring in a bonded context. My research aim has been known from the outset of the inquiry, to aid the policy implementation deficit regarding floodplain restoration; but what is the ‘unit of analysis’?

Yin (2003) makes the point that most researchers will want to compare their findings with previous research, so for this reason key definitions in the study should not be idiosyncratic, yet despite the similarity, my case study should innovate in a clearly defined manner. A previous example of research using a similar institutional approach, Wiering and Crabbé (2006) (see section 3.4), has concerned sector based policy arrangements of water management. As Wiering and Crabbé (2006) stated, by choosing underlying aggregation levels, for example water quality or flooding management, they could have reached far more detail in the research. Researchers also note that critical discourse analysis can be ‘an enormous endeavour’ and can only be taken in the form of many single projects by a number of successive researchers (Jager and Maier, 2009). In addition to floodplain restoration being a personal interest stemming from professional experience, the aim is to innovate and achieve a detailed level of analysis in this specific domain. As Jager and Maier (2009) note, such detailed single projects are extremely helpful in that they create reliable knowledge about certain sub zones of overall societal

discourse. This scientific knowledge can form the basis for a change of political knowledge and thereby a change in policies and behaviours (*ibid*). My ‘unit of analysis’, or case, is thus defined as the ‘policy arrangement of flood risk management’. ‘Policy arrangement’ will be defined in chapter 3 (section 3.4), but in summary a policy arrangement comprises four dimensions for analysis: discourses on flood risk management (traditional flood defence, as well as floodplain restoration); the rules of the game (formal policy and informal rules); actors involved in floodplain activities (with a particular focus on the two key stakeholders, water managers and planners) and their power and resources. This unit of analysis will enable an in depth study on how policy problems are constructed, and to what extent activities and decisions made on the floodplain lead to the new institutional practice of floodplain restoration.

As floodplain restoration is a strategic response set at a national governmental level, I have also set my unit of analysis at the national level. Although the unit of analysis is set at the national level of policy making, this does not necessarily have to coincide with the ‘level of observation’, at which the relevant empirical data is collected (Crabbé and Leroy, 2008). De Vaus (2001) also stresses that a well defined case study will avoid examining only some of the constituent elements but instead will build up a picture of the case with information gained from many levels of analysis. The insights gained from a number of different levels when taken together provide a much fuller, more complex understanding of the whole than would the perspective provided by any particular element of the case (*ibid*). The research is particularly interested in the ‘practitioner’ working at the ‘local’ level. Observations at such ‘lower’ levels can prove useful in providing a focus on the domestic factors that further hinder the implementation of national policy measures (Crabbé and Leroy, 2008).

Single Case - a common criticism of case studies concerns the generalisation of the findings of one case (Punch, 2005). When there is the choice (and resources) multiple case designs are preferred over single, the evidence from multiple case studies is considered more compelling, and the overall study is therefore regarded as being more robust (Yin, 2003). One of the few rationales for a single case study, however according to Yin (2003), is a ‘longitudinal’ case. This studies the same case at two or more points in time, and is favoured when there are likely to be certain changes in condition. The time intervals should be chosen to reflect the stages at which these changes should

reveal themselves. This approach also complies with a Foucauldian approach to discourse analysis, which dictates a thorough exploration of historical archival material in order to increase understanding of present day knowledges and practices (Kendall and Wickham, 2004 in Bazaley, 2007). The three time periods are thus defined as:

1. The institutionalism of the traditional discourse (1930s-1980s) – although commencing the narrative in the 13th century, when land drainage and flood defences are first documented, the analysis gains more detail from the 1930s with a pivotal change in institutional arrangements; the 1930 Land Drainage Act. The solidification of ‘flood defence’ in the policy arrangement is traced to the early 80s, as flood defences reach their height with the construction of the Thames Barrier in London (Chapter 4);
2. The turn in the discourse from flood defence to flood risk management, including floodplain restoration (1980s-2007) – ‘shifts in governance’ are traced, with the publishing of the influential World Conservation Strategy (1980) and the influential Brundtland Report ‘Our Common Future’ (1987), to the anticipated ‘turn in the discourse’ and Defra’s ‘Making Space for Water’ strategic response. The chapter culminates with the ‘shock event’ of the 2007 summer floods, poised at the window of opportunity, under renewed attention for the implementation of floodplain restoration policy (Chapter 5);
3. Has the window of opportunity been seized and have new concepts and practices on floodplain restoration institutionalised following the summer floods? (2007-2012) – this time period also coincides with the PhD field research, whereby archival material is enriched with observation, interview and focus group data (Chapter 6).

It was my initial intention to conduct a ‘best practice’ case study, identifying best practice cases, nations innovating and leading on floodplain restoration, with the objective to gain insight about the typical (England) by studying the atypical (Punch, 2005). The English case, in conducting an analysis across a long ranging time period, across research policy and practice and across disciplines (natural scientists, planners and engineers) proved all time consuming. Instead the research undertaken on international examples of best practice, with access to international conference presentations and workshops (Stockholm, Sweden 2011 (figure 2.2); Cardiff, Wales

2011; Darmstadt, Germany 2008; Ringkjøbing, Denmark, 2007) and publication¹ collaboration, supplements the final prescriptions and the data will be used in future research (see chapter 8). For full conference and publication details, see appendix 1.



Figure 2.2: Introductory Slide to Joint Presentation in Sweden, May 2011

The case study as a research strategy comprises an all-encompassing method, covering data collection techniques and specific approaches to data analysis, in addition to logic of design (Yin, 2003). Convergent evidence is sought regarding the facts and conclusions for the case (Yin, 2003). The role of theory development and testing is at the heart of case studies (Yin, 2003) and in Silverman's opinion, "without a theory, there is nothing to research" (p1). The case studies in floodplain restoration were evaluated through use of the theoretical constructs (see chapter 3), to answer applied, policy orientated research questions. However, "empirical research is only as good as the data on which it is based" (Punch, 2005, p19), the following sections will now detail how the data was collected and analysed in the four broad stages (outlined in section 2.2) to address the PhD's research questions.

2.4 Data Collection Techniques

The validity of data is affected by how well the data represents the phenomena for which it stands, and the choice of data and information collection strategy should follow from how the research topic is constituted and what the research is actually trying to

¹ Potter (2012) *Finding 'Space for Water': Crossing Concrete Policy Thresholds in England* In Warner, Van Buuren and Edelenbos (eds.) *Making Space for the River, Experiences with Multi-functional River Planning in the US and Europe*.

find out, i.e. that it has a good fit with the research questions (Punch, 2005; Silverman, 1993)). Critical Discourse Analysis approaches do not recommend specific sampling procedures, but the evidence for the existence of discourses comes from ‘texts’; what has been said or written about flooding and floodplains. A ‘discourse’ can be detected if there is similarity in what is said and written about flooding repeatedly across different texts that circulate in the same context. On the basis of similar statements being repeated or paraphrased in different texts, “we can put the puzzle back together and reconstruct the discourses texts draw on” (Van Leeuwen, 2009). Any findings or conclusions are also said to be more convincing and accurate if based on several ‘triangulating’ sources of information, following a corroboratory mode (Yin, 2003). Three major methods of qualitative research have been combined to reconstruct the discursive and organisational aspects of the flood risk management policy arrangements:

- ~ Documentation;
- ~ Observation;
- ~ Interviews and focus groups.

According to Luker (2008), it is also important to think about locations, ‘data outcroppings’, where we can find a good proliferation of the case study elements. Sampling strategies, as defined by Auerbach (2003), were based on:

- ~ Critical case sampling – in which I assumed that the theoretical constructs would be present and of central importance to the research (e.g. flood defence committees);
- ~ Convenience sampling - to which I had easy and immediate access and was considered informative (professional membership, conferences and workshops);
- ~ Typical case sampling – where the situation is typical or common in everyday life, so that it can be observed how the theoretical constructs operate in ordinary experience (Professional meetings and events, engineering practice, media sources).

Documentation

Documentary data was carefully used, noting that documents are not always accurate and can reflect an unknown bias of the author (Yin, 2003) (although noting that identification of bias could prove useful evidence in itself). An internet and archival search was conducted at a detailed level to source both contemporary and historical

documents, which were used to corroborate and augment evidence from other sources, or to make inferences and used as clues for further investigation (Yin, 2003), including:

- ~ Policy and strategic documents;
- ~ Agendas, announcements, minutes of meetings and other written reports of events;
- ~ Administrative documents, including proposals, progress reports;
- ~ Formal studies or evaluations of the same case;
- ~ Newspaper articles or other articles in mass media (debates or interviews on television and websites);
- ~ Academic literature (encompassing the disciplines of engineering, hydrology, geography, ecology, planning, social science).

Newspaper articles proved invaluable for the historical discourse analysis and maintained the contextual, political backdrop to the narrative to September 2012. The Times Digital Archive, available through the University of Liverpool Library e-resources, provided coverage from 1785. In addition, academic literature became data for analysis in its own right, to study the ebb and flow of the discourse (knowledge and ideology) of the authors (actors) across various professions and disciplines from 1924 to 2012. The literature was also employed to verify the contribution of social science research into flood risk management and floodplain restoration.

Going 'Native': Observation and Participant Observation

The major characteristic of qualitative research is that it is naturalistic and fundamentally depends upon watching and studying people and events in their territory and natural settings (Punch, 2005). Discourse analysis in particular often includes fieldwork and ethnographic methods, where ever possible, to explore the phenomenon under investigation for further analysis and theorising (Wodak and Meyer, 2009). Observation and participant observation played a particularly crucial role in the research. In the early stages of the research, it was these methods that led to the realisation; what I was observing was not what I had originally understood to be my research problem. After having used the theoretical literature to make sense of the initial findings, re-clarifying the scope of the research and having developed theoretical constructs I believed worth pursuing, observation continued to play a major role in my data collection. By concentrating my study on actors in their natural settings, I have aimed to illuminate and

to allow explication of the ways people in particular settings take action (or not) and manage day to day decisions and actions related to flooding policy through the use of the theories on institutional dynamics and discourse analysis that I have brought to the case (Luker, 2008; Silverman, 1993).

In qualitative research, observational studies are considered fundamental to understanding another 'culture' (Silverman, 1993). Although Silverman (1993) discusses 'culture' in, for example, reference to research by early anthropologists and 1930s sociologists in Chicago who pioneered case studies of non-western societies, I found this method equally applicable to understanding different 'cultures' across the disciplines in my research, including planning, engineering, hydrology and ecology. Anthropologists maintain that to understand a group of people, one must engage in an extended period of observation, immersing within a culture over a period of years, 'learning the language' and participating in social events. In the initial year (whilst undertaking the required modules in Research Methodology) I attended University of Liverpool lectures in Water Management (within the Faculty of Engineering), Geomorphology (Department of Geography), in addition to a private course on Flood Risk Assessments (JBA Consulting, Skipton) to aid my learning of 'new languages' across the different disciplinary cultures. Observational data was collected, as a passive observer, at flood defence committee meetings in the North West and Thames region and at approximately sixty meetings, conferences, workshops and other events across the disciplines (see table 2.1).

Data was also collected through active participation in the events being studied (table 2.1 - highlighted in blue, not including conference presentations/convening). Through participant observation, I gained unusual opportunities for collecting data, particularly in gaining access to events, groups and individuals that otherwise would have been less accessible, or even inaccessible, to study (Yin, 2003). As Yin (2003) observes, participant observation allows the distinctive opportunity to perceive reality from the viewpoint of someone 'inside' the case study, or as phrased by Silverman (1993), sharing in people's lives whilst attempting to learn and understand their symbolic world. In the early stages of the PhD research (possibly with the history of being a practitioner close behind), 'action research' was considered as an overarching approach for the PhD. Although rejecting the approach in favour of data collection at a national level, elements

of action research enhanced my participant observation. The aim of action research, described by Reason and Bradbury (2001) as seeking to “bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people” (p1). In addition, I presented papers at fourteen conferences and workshops, providing direct observations of actors’ reactions to my specific research issues (appendix 1).

Table 2.1: Observation and Participant Observation Activities (11/07-09/12)

Date	Discipline/s	Observation Type	Location
07/09-09/12	Engineer	Meeting (Flood Defence Committee) x2	NW/SE England
05/09-09/12		Activity (Consultancy Bid) x3	National
01/08-06/12		Conference/Workshop (CIWEM/BHS/ICE/Catchment Management Centre) x10	National
01/09-05/09		Applied Hydrology Lectures/FRA Course	NW England
09/08-09/12	Hydrologist	Meeting (British Hydrology Society) x4	NW/SW England
07/08-09/12	Geographer/ Geomorphologist/ Ecologist	Green Infrastructure Think Tank x6	NW England
08/08-12/09		Conference (Impact Assessment/ River Restoration Centre/RGS) x4	SW/Midlands SE England
03/10-09/12	Planner	RTPI Cymru Policy and Research Forum (Deputy Chair)/Management Board x12	Wales
11/07-06/12		Conference/Workshop (RTPI/AESOP) x9	NW England/ Wales
11/09-09/12	Planner/Engineer	Activity (Planning Aid Wales Flood Consequence Assessment)	Wales
11/07-02/12	Engineer/Planner	Workshop/ CPD Event (RTPI/CIWEM/BHS/ENMAR) x6	Wales/England/ Sweden
11/07-04/12	Geographer/ Planner	Forum/Meeting (Green Infrastructure Forum) x10	NW England
09/09-09/10	Social Scientist/ Geographer	Workshop (Neoliberal Policy Agendas Workshop, Hull/ Vitae Ormskirk	NE/NW England
06/09-07/12	Practitioner/Public	Forum/Workshop (Mersey Estuary/ Weaver Valley Regional Park)	NW England

(Participant activities in blue.)

In total, ‘narratives’ (see section 2.5) were coded from 154 academics (22%), policy makers (27%) and practitioners (51%) associated with the policy arrangement across the disciplines, the percentage distribution displayed in figure 2.3. The actors included several key or influential figures active in the policy arrangement. Those publicly speaking included: Keith Beven (University of Lancaster, Hydrologist); Peter Bide (DCLG, Physical Scientist (and NB not planner)); Rob Cunningham (RSPB); Alistair Driver (EA, Ecologist); Edward Evans (Co-author of the Foresight Report, Engineer); Karen Fisher (Chair of River Restoration Centre, Engineer); Roger Harrabin (BBC’s

Environment Analyst); Sir David King (former Scientific Advisor to HM Government, Physical Scientist); David Lerner (University of Sheffield, Engineer); Joe Morris (Cranfield University, Geographer); Arthur Philp (ABI); Sir Michael Pitt (Author of Pitt Review, Engineer); David Rooke (Director of Flood and Coastal Risk Management, EA, Engineer); Chris Smith (Chair of EA, English) and Roger Wand (DCLG).

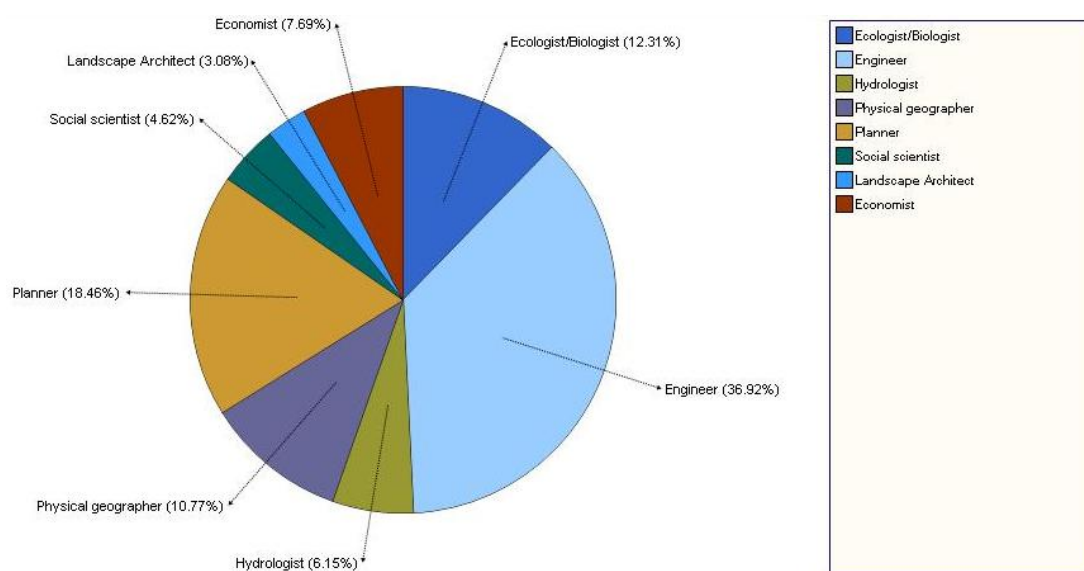


Figure 2.3: Proportion of Narratives Coded Across the Disciplines (2007-2012)

Interviews and Focus Groups

In part due to the lack of opportunity to observe planners and engineers interacting, two interdisciplinary workshops were co-convened by myself with engineering/hydrologist and planning colleagues (Dr. Sarah Ward, University of Exeter and Dr. Neil McDonald, University of Liverpool, Charlotte Beattie, Wrexham Borough Council) in January 2010 (British Hydrological Society) and February 2012 (RTPI and CIWEM). As part of the co-convened interdisciplinary workshops (appendix 2), a ‘break out’ session and focus group permitted the collection of data on participants views’ of natural approaches to flood risk management (see table 2.2). One of the hallmarks of focus groups is the explicit use of the group interaction to produce data and insights that would otherwise be less accessible without such interaction found in a group (Morgan, 1988). Focus groups are also known for stimulating participants in making explicit their views, perceptions, motives and reasons (Punch, 2005). They are also considered by Punch (2005) to be inexpensive, data rich, flexible, stimulating, cumulative and elaborative. In

addition to observational material from the formal presentations and networking, the events' 'break out' and focus group allowed observations to be made on how people experienced and reacted to flood risk management issues in situated contexts, through informal questioning, conversations and discussions (Fairclough, 2009).

Table 2.2: Focus Group Members (01/10) and Formal Interviewees (05/07-09/12)

Date	Discipline/s	Name	Location
Focus Group			
01/10	Engineer	Matt Hemsworth, JBA Consulting	NW England
	Engineer	Chris Isherwood, JBA Consulting	NW England
	Engineer	Richard Kellagher, HR Wallingford	SE England
	Planner	Tom Ferguson, Mersey Forest	NW England
	Planner	Charlotte Beattie, Wrexham Council	Wales
	Planner	Lorna Jackson, 4NW	NW England
	Planner	Bob Massingham, St Helens Council	NW England
	Planner	Miriam Evans, Waterco	Wales
	Planner	Liz Hill, Planning Inspectorate	NW England
	Geomorphologist	Janet Hooke, University of Liverpool	NW England
	Ecologist	Francis Hesketh, TEP	NW England
Interviewees			
05/07	Engineer	John Lymer, Environment Agency	NW England
09/08	Engineer	Jonathan Cooper, JBA Consulting	NW England
09/12	Engineer	Peter Jones, Waterco	Wales
05/07	Planner	Matt Ellis, Environment Agency	NW England
06/11	Planner	James Hooker, Welsh Government	Wales
05/07	Resource Manager	Andy Penton, Environment Agency	NW England
03/11	Biologist	Ross Marshall, Environment Agency	England

BHS National Meeting "Bridging Troubled Waters - Hydrology and Spatial Planning", January 2010, University of Liverpool - The focus group was convened to enable the capture of relevant issues and categories for subsequent data collection. Eleven participants, planners (in the majority), engineers, hydrologists, ecologist and a geomorphologist) self-selected the group and were questioned simultaneously (see Table 2.2). Rather than alternating between asking questions and receiving an answer, the group was facilitated, monitored and the group's interaction digitally recorded (Punch, 2005). Francis Hesketh, (TEP, Ecologist) facilitated the group with a set of prompts prepared by myself. This allowed my full concentration on the dynamics of the group, and the elimination of personal bias in delivering the questions. Problems concerned with focus groups are associated with group culture and dynamics and achieving balance in the group interaction (Punch, 2005). The group was expertly facilitated and such problems were not experienced.

RTPI Wales/CIWEM SW Regional Meeting ‘Water and Planning: Crossing Boundaries and Bridging Gaps’-A Joint Workshop Forum for the Changing Water and Planning Policy Arena across England and Wales, February 2012, University of the West of England - The ‘break out’ session (see figure 2.4) formed an informal focus group, run twice in succession, with approximately 30 planners and water managers in total. Sue Illman (Consultant Landscape Architect) led the discussion, presenting natural flood risk management schemes to the self-selected delegates. Both Sue Illman and I led a semi-structured discussion following the presentation.



Figure 2.4:
The Author,
introducing the 'Break
Out' Sessions, UWE

Interviews are considered one of the main data collection tools and most important sources of case study information, particularly as in common with most case studies this is about human affairs (Yin, 2003) and capturing the perceptions of actors (Silverman, 1993). According to interactionism, interviewees are viewed as experiencing subjects who actively construct their social worlds, the primary issue is to generate data which gives an authentic insight into people’s experiences (Silverman, 1993). The main way to effectively achieve this are considered to be unstructured, open-ended interviews that are often based upon prior, in-depth participant observation (Silverman, 1993). Questions were posed in a conversational style, in an unbiased manner, yet serving my required line of inquiry, being theory driven. Interviews were semi structured, allowing in depth interviews with some prior structure to seek further insights driven by the theoretical constructs, but with the flexibility to cover issues and topics that might not have been previously examined in the evaluation framework. Through the initial act of observation and participation, I was also fortunate to identify, meet and obtain access to key informants for informal, unstructured short interviews and opportunistic

conversations. Having undertaken primary analysis of the observational data, key respondents provided important insights and corroborating evidence for the ongoing observational and documentary data analysis (Yin, 2003). Due to lack of consent, or for the offering of sensitive information, these respondents remain anonymous. All comments in italics are quoted in verbatim, followed by a coding (in brackets) that links to transcripts held in *NVivo* (see section 2.6).

Transcription

It is the process of recording and transcribing materials that makes ‘data’. “Transcripts are decontextualised conversations....a living, ongoing conversation is frozen into written text. The words of the conversation, fleeting as the steps of an improvised dance, are fixated into static written word” (Bazaley, 2007, p46). The goal in transcribing, as described by Bazaley (2007), is to be as true to the conversation or observation as possible, yet to be pragmatic in dealing with the data (*ibid*, 2007). As not all data requires full transcription, digressions from the topic, considered of no significance were simply recorded that there was a discussion about ‘x’. Field observations were not recorded verbatim, field ‘notes’ were considered adequate.

Theoretical Saturation

Discourse analysis looks to capture the qualitative range of what can be said and how it is said in one or more discourse strands, the analysis is thought to be complete if further analysis leads to no further new findings (Jager, 2009). With regards to methodology, this means that new materials are collected and analysed until it is noticed that arguments begin to repeat themselves and the same information is heard over and over again. When this point is reached, then theoretical saturation has been achieved (Auerbach, 2003; Jager, 2009). Data collection and analysis continued as long as new information was being uncovered about the research concern and it did not add to further understanding of the theoretical constructs.

2.5 Data Analysis

Silverman (1993) considers analytical issues to be central to methodological discussion, the quality of the analysis being perhaps more important than the choice of sample or

format of the interview. Unfortunately however, the analysis of case study evidence is said by Yin (2003) to be one of the least developed and most difficult aspects of doing case studies. Silverman (1993) also adds that there are few formulas or ‘cookbook recipes’ to guide the novice and too many times investigators start case studies without the foggiest notion about how the evidence is to be analysed, leading to an analysis that resembles a disorganised stumble through a mass of data, full of ‘insightful’ observations of a mainly ‘anecdotal’ nature (*ibid*). Silverman is also uncomfortable with a fairly large proportion of ‘qualitative’ research in leading academic journals, in which he feels the aim is to empathise with people and to turn ourselves into mirrors of other people’s experiences, with the use of data extracts which support the researcher’s argument, without any proof that contrary evidence has been reviewed. Silverman (1993) proposes that social theory is not an ‘add on’ extra, but is the animating basis of social research, as we cannot be satisfied merely with ‘telling convincing stories’, there is no reason why qualitative research cannot combine insight with rigour.

Establishing the meaning of a text is usually seen as working at two levels: the surface or literal, and the deeper meaning, arrived at by some form of interpretative understanding (Gilbert, 1997). Content analysis is a commonly used method, to ascertain how important a particular theme is by measuring the number of times it is mentioned. However, content analysis can be considered unsubtle, and sociologists have sought for more sophisticated methods, including discourse analysis, to get to the underlying, deeper messages of the text (*ibid*). The following paragraphs describe the rigorous coding process undertaken, techniques and process influenced by qualitative researchers (Auerbach, 2003; Bazeley, 2007 and Silverman, 1993), and more specifically critical discourse analysts (Fairclough, 2009; Jager and Maier, 2009; Wodak and Meyer, 2009).

Theoretically Derived Coding

Documents, interview transcripts and field notes have been analysed and interpreted in order to discover meaningful patterns in the policy arrangement of floodplain restoration “No one is smart enough or intuitive enough to read a series of transcripts and immediately see the patterns within them” (Bazeley, 2007, p32), instead the raw field notes, transcripts and documentation require classification to make sense of them and to bring order out of chaos. It is considered that any researcher wishing to become

proficient at doing qualitative analysis must learn to code well and easily; “the excellence of the research rests in large part on the excellence of coding” (*ibid*, p66).

A code is described by Bazeley (2007) as an abstract representation of an object of phenomenon, or a mnemonic device used to identify themes in a text – the who, what when, where and how of what is going on in flooding policy arrangements. In coding, “capturing the detail of the text does not mean that you should segment it into tiny, meaningless chunks. Rather, the goal is to capture the finer nuances of meaning that lie within the text, coding enough in each instance to provide sufficient context, without clouding the integrity of the coded passage” (*ibid*, p69). Interpretative analysis takes account of more than the content of what was said, but how things are said and the revealing discourse features of the text (*ibid*). Texts are seen as ‘narratives’, as described by Luker (2008) as stories about what the person being interviewed or observed thinks happened, should have happened or even wanted to have happened, or as the postmodernists claim..... “accurate accounts of the mental maps that people carry around inside their heads (Luker, 2008, p168). It was this ‘deeper truth’ that I was interested in, why the actors chose to report or tell their version of reality in a particular way. Through multiple interviews, observations and documentation you get to find out the numerous mental maps inside, not just one, but lots of people’s heads; “when you hear the same thing from people all over the country who don’t know one another, you can be reasonably sure that you are tapping into something that is reliably social and not just individual” (Luker, 2008, p168).

NVivo

NVivo, under the prior name ‘NUD*IST’, was ‘born’ in 1981. An academic, Tom Richards’ teaching Logic at La Trobe University, Melbourne, designed the software to assist his sociologist wife at the same University. Lyn Richards was experiencing difficulties with “boring, time consuming and not very rigorous” coding by hand, in which dogs and babies mixed with the precious piles of paper and paper segments. Her two year old son crawling through one of the piles of paper and eating a “never to be retrieved” quote led to the conversation with her husband to develop the program (Richards, 2005, p89 in Bazeley, 2007). There are three major Qualitative Data Analysis (QDA) programs on the market: NVIVO, Atlas.ti, and Ethnograph. I used NVivo, for three reasons. Firstly, the coding methods of Auerbach (2003) translate naturally into

NVivo (and it is their QDA of choice); secondly it is described by independent users as flexible, powerful with an intuitive and user friendly interface (Bazeley, 2007) and thirdly it is the University's choice of software and therefore available at little cost. The use of software is not intended to supplant time honoured ways of learning from data, but to increase the effectiveness and efficiency of such learning – through the computer's capacity for recording, sorting, matching and linking. This capacity can be harnessed by the researcher to assist in answering their research questions and it is said that the use of such a program helps to ensure rigour in the analysis process (*ibid*). NVivo does not prescribe a method, but supports a wide range of methodological approaches. Following a literature search, I used and developed the coding process detailed by Auerbach (2003) that was very compatible with my research. They see coding as the steps of a staircase from raw text at the bottom, through small steps of relevant text, to repeating ideas, to themes, to theoretical constructs to theoretical narrative and the research concerns at the top of the staircase. NVivo stores coded data in 'nodes'. These steps created a coding tree corresponding to the levels of data analysis, level 1 tree node coding repeating ideas, level 2 tree nodes coding themes and level 3 tree node coding theoretical constructs.

Relevant text selected for further analysis - Passages of the transcript, the 'raw text', that were considered to be related or relevant to the theoretical constructs of the research, were highlighted as 'relevant text', the rest was discarded to make the text easier to work with. The theoretical framework influenced what was included and excluded from the analyses to read the text in a more focused way. It was also noted how things were said, the use of collective symbols, the argumentation and vocabulary used (Jager and Maier, 2009). What was *not* said was also of interest; noting constructs neglected and conspicuous by their absence (*ibid*). 'Free nodes' were created for the relevant text through *in vivo* coding (coding directly from the text), recording the theoretical construct to which each node corresponded to. A 'databite' memo was recorded providing the title of the node, and an annotation as to initial thoughts on the reason the words or phrase were considered relevant and which could be used to develop new theoretical constructs. The process was repeated, reading through all data transcripts.

Repeating ideas - The relevant text for each theoretical construct was systematically searched for repeating ideas, the same or similar words and phrases to express the same

idea or sub topic in the discourse strand across different transcripts. Repeating ideas of relevant text within a theoretical construct were grouped into a 'repeating idea' level 1 tree nodes, which coded the idea they had in common. In terms of missing repeating ideas, as Auerbach (2003) notes, if an idea is really important, it will be mentioned by more than one participant and it is likely to be selected as the coding proceeds. The frequency of a repeating idea was examined, and whether they were more frequent at a particular time (noting the relation to discursive events) (Jager and Maier, 2009). 'Orphan text' was also collected if it seemed relevant but did not link conceptually with the other repeating ideas (in particular to keep in mind potentially new theoretical constructs). Having been immersed in the text, in this most labour intensive time, as Auerbach predicted, it meant I acquired an invaluable familiarity with the text.

Organise themes - Repeating ideas were then organised into coherent categories, larger groups that expressed a common 'theme'. A theme is an implicit idea or topic that a group of repeating ideas have in common. Level 2 tree nodes were created corresponding to the theme. 'Repeating idea' tree nodes were made, In NVivo 'speak', children of the parent 'theme' node.

Theoretical constructs - The themes are used to elaborate the theoretical constructs, to discover the specific form the theoretical constructs take when applied to the flood policy research sample, to understand more about the theoretical framework and the themes and how they relate to each other. New tree nodes were created corresponding to the theoretical construct. The theme nodes were made children of the theoretical construct parent node. New theoretical constructs were created by organising themes into meaningful units.

As with the main stages of the research overall, although presented as sequential steps the coding process was not a linear one, but I moved backwards and forwards between steps, for example, from recoding a repeating idea from one theme to another, to developing and recoding for new theoretical constructs. As well as for conceptual categories, NVivo was also used to code contextual and descriptive data, such as dates, professions and disciplines. NVivo allowed the research to grow into a web of data, categories and thinking to allow the research questions to be illuminated (Bazeley, 2007). "Sociologists might be familiar with the idea of nodes in a social or a semantic network.

Horticulturists know a node as a point at which branching might occur in a plant. Similarly, in a fully developed NVivo coding system, nodes become points at which concepts potentially branch out into a network of sub-concepts or dimensions” (*ibid*, p83). Actors were also coded as nodes, for which attributes were assigned. From here, it was possible to ‘ask questions of the data’, whereby the program retrieves all information relevant to the question from the database that I had created. Slicing data into its component parts opens up analytical possibilities, through the recombination of coded passages, for example, experiences or processes could be discovered to be different for members of different groups/disciplines (different discourses). Finally, the theoretical constructs are woven into a device called a ‘theoretical narrative’, to elaborate and refine the constructs and summarise the research. The theoretical constructs are used to organise the observations and experiences of the interviewees into a coherent story. In contrast with a traditional more distant ‘scientific’ stance, the language of the actors involved, and their ‘repeating ideas’, are put in quotes (in italics) to make the story “come alive” and feel “vivid and real” (Auerbach, 2003, p73).

There is a concern expressed regarding case studies, in that they do not provide a basis for scientific generalisation. However, it is not the intention of a case study to be a representative random sample upon which findings are generalised to a wider population on the basis of statistical probability. Instead the findings of case studies (in a similar manner to experiments) are generalisable, or some qualitative researchers term ‘transferable’, to the appropriately developed theory (Auerbach, 2003; De Vaus, 2001; Yin, 2003). It is this theoretical dimension of case study research that is of value in wider generalisation and one of the main goals of social science research (De Vaus, 2001). The theoretical narrative also points towards future research through the reformulated theoretical framework and research concerns, focusing attention on what I am still not quite clear about or areas requiring further theoretical elaboration.

2.6 Quality of the Research

Essential research principles have been adhered to, regardless of the sources of evidence, to deal with issues of reflexivity and transparency, validity and ethics.

Reflexivity and Transparency

Critics of case study research assert that subjective judgements are used to collect the data and research conclusions can be based on the researchers own impressions (Yin, 2003). However, qualitative researchers believe it is justifiable, even somewhat inevitable, to be subjective in analyzing and interpreting data; subjectivity and values are a necessary part of human interaction and therefore cannot be eliminated or controlled. Many also believe that their own subjective experience can be a source of knowledge about the phenomenon (Auerbach, 2003). However, it is not justifiable to impose this subjectivity in an arbitrary manner, instead subjectivity is acknowledged but reflected upon in a “systematic and disciplined way” (*ibid*, 2003, p27). Reflexive research requires scrutiny of one’s own social and political beliefs and assumptions, in how these affect analysis of the data, and how these can be ameliorated or made transparent (Sefton, 2009). As such, I came to realise that my research interests, explicit values and norms (environmentalism, ‘living with nature’), are also the result of a discursive process (Wodak and Meyer, 2009).

In terms of the large component of the data collection for this thesis, participant observation, although the method gives an invaluable perspective in achieving an accurate portrayal of phenomena, the situated character of interaction must be understood as it also has the potential for bias. This includes assuming positions or advocacy roles contrary to the interests of good science, becoming a supporter of the group or organisation being studied or purely in that the participant role can distract from the observer role (Yin, 2003). Being a fully-fledged participant, familiarity with the setting or event can also lead to overlooking what a more objective observer would deem ‘quite strange’ (Luker, 2008). Although maintaining alert to the potential drawbacks, in my experience, collaboration and participation with relevant organisations and groups allowed me to retain a grounding in ‘reality’, rather than commence the ascent up an academic ivory tower, to test my emerging ideas and recommendations in practice and conclude the research with more practical recommendations, rather than some form of idealised reasoning. It was important personally that I paid particular attention to practitioners involved with policy implementation, something that the rational model of research is charged with ignoring (Nutley, 2002). Nutley *et al.* (2002) believe that practitioners and a search for understanding of their problems should be on a par with examinations of challenges facing researchers and policy makers. ‘Pushing

information from the centre out' is often ineffective and strategies need to be developed to encourage a 'pull' for information from potential end users (Nutley et al, 2002).

For the data analysis to be transparent, other researchers must know the steps by which you arrived at your interpretation (Auerbach, 2003). Auerbach (2003) notes that this does not mean that other researchers necessarily have to agree with your theoretical framework and interpretation, but that they can see how it was arrived at and it has not been 'made up' to suit any prior prejudices and bias. As such, my analysis and interpretation have been grounded in the data, and not subject to my prejudices and biases through a lack of regard to the data (*ibid*). This methodology chapter is also aimed at making my data analysis and interpretation procedure transparent, providing a comprehensive record of the research procedure and steps undertaken. As is also advised by discourse analysts, description and interpretation have been kept apart in the empirical chapters, to further enable transparency and reproduction of the ensuing analysis (Wodak and Meyer, 2009). The relevant text from the coding process has been incorporated into chapters 4 to 7, verbatim quotes in italics allowing the 'voices to speak' for themselves, so that it can be seen how the narrative is grounded in the data. A further 'chain of evidence' has been established, codes link to the relevant sections of the case study data base (coded by year, sequence of transcript in the year and actor).

Validity

The forms of validation suggested as being particularly appropriate to the logic of qualitative case study research are triangulation, respondent validation and maintaining a database.

Triangulation - One of the major strengths of case study data collection is the opportunity to use multiple sources of evidence, where the benefits are maximised through converging lines of inquiry; known as 'triangulation' (Yin, 2003). Section 2.4 has detailed the multiple sources of evidence that have been sought and used to encourage convergent lines of inquiry. In particular it is noted that verbal recall of situations can be influenced by bias, poor memory or inaccurate articulation by interviewees (Yin, 2003). Interview and field data can be combined to make sense of the other.

Respondent Validation - Auerbach (2003) states that for data analysis and interpretation to be justifiable it must also be communicable, making sense and understood by other researchers and to the research participants themselves. The research has been presented to ‘critical’ listeners and audiences (see appendix 1), to engender alternative interpretations of the facts. By having draft copies of the thesis, or relevant chapters, reviewed by an engineer, ecologist and neutral discipline, facts and evidence have been discussed and corroborated (Yin, 2003).

Database - A data base has been maintained in NVivo, available for independent inspection, including time and place of observations, interviews, focus groups and documents, including the raw data files from field work. This also includes notes from casual conversations with colleagues and participants in the field, ideas and memos from a ‘research diary’ spanning the length of the PhD research.

Ethical Issues

In observing and reporting observations, Punch (1986) believes there is a balancing edge between overt and covert, and between openness and less than open, and academics should weigh up the consequences for the subjects, the profession, and themselves (Punch, 1986). Ethical issues concerned the confidentiality and anonymity of interviewees and observed persons and organisations. For the former, interviewees have been named, but their comments remain anonymous amongst other actors’ quotes.

Claim for Originality

‘Originality’ is an essential requirement for PhD research. Rather than ‘pushing back the frontiers’ of knowledge within a single discipline, I have aimed to achieve originality in working across the disciplines and professions of water management and planning. “Much of the best work comes from cross-fertilization between apparently unconnected fields” (Cryer, 2006). Having a sound grounding in biology from my undergraduate degree and environmental management from my first master’s degree, it is therefore not surprising that I identified with the discourse of floodplain restoration. Originally motivated to incorporate myself within the dominant research paradigm of my field, I eventually was stimulated to view the research problem from outside these disciplines, from the social sciences, to do justice to the complexities of social reality, yet to continue to converse with specialists in water management. The choice of methodology

is not ‘mainstream’ in social science research on *social* issues per se, but I have sought to use procedures, tools and techniques from the interpretative paradigm in new untested ways in the *environmental* domain, i.e. in flood risk management in England. Viewing the problem for a perspective of another discipline, I feel, has opened up alternative findings and recommendations, meeting a need for research aimed at augmenting the effective translation of policy and best practice aspirations from water management into the complex planning practice arena. This has aimed to facilitate the potential use of floodplain restoration for flood risk management. Such a research undertaking is considered a claim for PhD originality by Cryer (2006). As Richard and Hughes (2008), natural scientists, stated following their research on floodplain restoration; “this is fertile ground for working through an interdisciplinary research agenda with a necessarily pluralist methodology early in the 21st Century” (p38).

Onwards to the Theory

Having fully outlined the research design and methodology, it is the articulating theory that operationalises case study designs (De Vaus, 2001; Yin, 2003). The next important step in the research, and journey through the thesis, is the development of a rich theoretical framework. Although expressing the concern that “one of the bad things that happens to some students who take courses in social theory is that they end up being convinced that a whole series of theorists are little more than congenital idiots” (Silverman, 1993, p197), Silverman experiences discomfort with a fairly large proportion of ‘qualitative’ research in leading academic journals, whereby the stress on the use of an increasing body of empirical knowledge and theoretical approaches is subordinate to the ‘exploratory’ nature of the research. A previously developed theory and a set of expectations derived from previous research can be used as a template with which to compare the empirical results of the case study (Yin, 2003). Chapter 3 will now develop the necessary theoretical ‘template’ from which to survey the policy implementation deficit of floodplain restoration, to approach the case study research and test social science theory in a ‘real life situation’ (*ibid*).

3

Analytical Framework: the Institutional Dimension of Critical Discourse Analysis

*Theories are like the lenses of the kaleidoscope;
when you slot different ones into place things you could not see before
suddenly become visible; patterns that were indistinct become sharper*

Nigel Gilbert, 1997

Following the serious flooding events in the UK Summer of 2007, the effects of ‘shifts in governance’ calling for a more integrated and sustainable approach to integrated water management were not yet providing the steering capacity for a mainstream change of approach in England. The majority of authors have embarked on rational analyses and evaluations of the obstacles to change. This thesis sees the advocated new approach as a challenge to the institutions involved in the flooding policy arrangement and thereby aims to enhance insight into the policy implementation deficit by raising alternative research questions originating from the interpretative paradigm. After operationalising the research context of ‘shifts in governance’ (set in chapter 1), section 3.2 and 3.3 expand on the theoretical positioning, with the main concepts of the research, ‘institutionalism’ and ‘critical discourse analysis’ respectively, the theory and methodology of which are drawn upon to develop the analytical framework based on the Policy Arrangement Approach, in section 3.4. The analytical framework, and derived research questions in section 3.5, will underpin and drive the empirical analysis of the various effects and responses to shifts in governance on the established institutions of water management and planning in England, in the land use ‘shift’ from defending development on floodplains to protecting and restoring functional floodplains.

3.1 The Inescapable Downpour of 'Political Modernisation'

It is widely accepted by scholars in the political science communities that western societies have reached a new, qualitatively different form of modernity (Beck, 1992; Giddens, 1990; Hajer and Wagenaar, 2003; Lash *et al*, 1996). In the first phase of modernity, from the 19th century, we were steered by a top-down, state-led, command and control governments, the state considered to be the supreme regulatory body within its own boundaries. The dominant discourse at this point was 'manageable society' (Arts and Van Tatenhove, 2006). The Western regulatory state lost credibility and power, due in part to the crisis of the Keynesian welfare state, moves towards globalisation, Europeanisation, individualism, the dematerialism of our economies and the growth of IT (Arts and Tatenhove, 2006; Hajer and Wagenaar, 2003; Yearley, 1996). Other authors, notably Beck, attribute high consequence risks produced as a side effect of scientific and industrial development and the irreversibility of their environmental consequences to the state's loss of power (Beck, 1992; 1996; 1999).

With a policy agenda challenged with issues from air pollution during the 1970s, to acidification in the 1980s, the initial stages of environmental policy making witnessed major endeavours by government bodies in the development of sectoral legislation and the setting of environmental standards and planning (Arts and Van Tatenhove 2006). However, traditional top-down policy-making appeared to be less effective, efficient and legitimate than it had professed to be and society less manageable and far more complex than initially believed in the early phase of modern politics, the effects of policy-making in many cases being "unknown, unintended or unforeseen" (Arts and Van Tatenhove 2006, p34). According to Beck's 'Risk Society', side effects such as pollution and ecological degradation occur against our wishes, we cannot foresee them and they can extend to other places initially not connected. The classical-modernist nation state, it appeared, was unable to guarantee security and prosperity for all into the future due to its eroding powers and capacities (*ibid*, 2006). Beck argues that if the state cannot fulfil its responsibility to control the emerging risks, we have to look beyond the classic nation state society and develop new forms of governance. Indeed, Leroy and Arts (2006) find it striking that almost all authors in the modernity debate point at environmental issues as the "manifestation par excellence of present-day modernity and the problems it provokes" (p11).

The second phase of modernity, otherwise known as ‘post-modernity’ or ‘late modernity’, has developed beyond the nation-state model, whereby new ideas have shaped ‘governance’, and how government should steer society (Arts and Goverde 2006). Government institutions have been renewed with phenomena such as deregulation, decentralisation, ‘doing more with less’, liberalisation, interactive policy-making, contract management and client oriented management (*ibid*, 2006). From state dominated policy making based on constitutional patterns and regulatory strategies, new approaches have led to an increasing variety for means of organisation and management, whereby networks and partnerships of public, private and third sector actors provide new forms of multi-actor, multi rule and multi-level governance under new themes (Arts and Van Tatenhove 2006). In the environmental domain, whereas originally the steer and responsibility was largely with state environmental policy departments and agencies based on regulatory strategies, environmental policy has also evolved into a ‘multi-sector’ and ‘multi-actor’ field which appeals for shared responsibilities, new participatory approaches, integrated management and voluntary agreements across different policy domains (Leroy and Arts, 2006). As with wider societal policy, this discursive change in environmental problems and their sought solutions have been increasingly linked to other fields of concern, economic and technological, and consequently other policy domains, including agriculture, infrastructure, traffic, and notably, spatial planning (*ibid*). Policy makers must partake in new ways of reflexive policy making and voluntary agreements, based on new rules beyond the traditional divides (Arts and Van Tatenhove 2006). Such concepts call for the renewal and reconfiguration of roles for the various agencies involved with new interrelations and coalitions, organisational strategies and policy instruments (*ibid*).

Lack of Understanding of Renewal in Environmental Policy

Although many analysts accept that the new forms of governance are a logical response to a rapidly changing world, the new ‘network society’, some authors from the social sciences find that there is something profoundly disturbing about the “rush into a restyling of the practices of government” that accompanied the new vocabulary (Hajer and Wagenaar, 2003, p4). Despite the acknowledgement of the complexities of new governance, they postulate that these new commitments are not often based on a rigorous analysis of what exactly is ‘new’ about our reality, it remains unclear how the changes and transformations in political modernisation challenge the activity and

effectiveness of policymaking and politics (Verbeeck and Leroy, 2006). The understanding and explanation of how environmental policy had been renewed over the past two decades is very limited, for example how this has happened in specific policy contexts, what the ‘newness’ precisely consists of and how to judge the developments (*ibid*). A prime example is the plea for ‘multi-sector’ governance, causing co-ordination problems in the trend towards integration of adjacent policy fields. Current flood risk management policy discourses can be positioned against this contextual backdrop of an important change in wider environmental policy discourses, and more general policy, that have emerged in the past few decades – a shift from ‘government’ to ‘governance’.

Shifts in Governance

‘Shifts in governance’ or its synonym, ‘political modernisation’ is an analytical concept defined by Arts and Van Tatenhove (2006) as the “shifting relationships between the state, market and civil society in political domains of societies – within countries and beyond – as a manifestation of the ‘second stage of modernity’, implying new conceptions and structures of governance” (*ibid*, p29). The concept, based on political and social science theories, is used by researchers in an attempt to encapsulate these structural transformations in societies of a rapidly changing world which have consequences for policy making and practice (Arts and Van Tatenhove, 2006). Political modernisation, Leroy and Arts (2006) admit, is an extensive debate and they see it as a ‘container’ concept, in “an all pervading trend or development which influences the policy practices of actors as if it were an inescapable downpour” (Leroy and Arts, p103). Following the ‘downpour’ of 2007, it can be seen that a broad coalition of interests, (called for by David Miliband in chapter 1), involved in new forms of ‘governance’ on the floodplains had not yet been mobilised. As observed in the wider environmental domain, it also remains to be assessed both in practice and from empirical evidence as to whether, and to what extent, these new forms of governance do bring about changes in legitimacy and responsibility, and do increase our capacity for tackling and solving flood risk management problems in the most ‘sustainable’ manner (Leroy and Arts, 2006). As Hajer and Wagenaar (2003) state, we are in need of new systems of governance in this era in which so many of the most pressing problems and issues do not conform to the levels at which governmental institutions are most capable of producing effective or legitimate solutions. They, along with other authors, feel it is an under-appreciated ‘interpretative’ and ‘critical’ approach to policy analysis that has a

much wider relevance and promotes a much more subtle understanding of the contemporary problems of new practices of governance.

Taking an Interpretative and Critical Approach

It was back in the early 1980s that critical policy analysts “began to aim their arrows” at mainstream, traditional, positivist, technocratic policy analysts, whose methodological principles of how to collect data in a proper way, to a rhetoric of accepted ways of talking about knowledge and policy, they believed had both biases and limitations in dealing with politically charged issues (Hajer and Wagenaar, 2003). Interpretative social science counters the search for causality and the uncovering of general laws that is characteristic of the natural sciences, and instead aims to shed light and add insights to the meaning of certain social processes in society (Hajer, 1997). Post-positivist, social constructivist approaches and critical policy analysis grew from the 1990s, including influential publications such as Frank Fischer and John Forester’s ‘the Argumentative Turn in Policy Analysis and Planning’ (1993) and Maarten Hajer’s ‘the Politics of Environmental Discourse, Ecological Modernization and the Policy Process’ (1997). New themes for analysis on ‘shifts in governance’, in particular, drew on the macrosociological insight of contemporary environmental sociologists on more fundamental and encompassing issues of late modern societies, such as the role of ‘duality of structure’ (Giddens, 1991, 1992) and risk society (Beck 1999; Beck, Giddens and Lash 1994). Meso-level theories and approaches from sociology and political science, including discourse analysis (Hajer, 1997), various policy network approaches (Glasbergen, 1989; Marsh and Rhodes, 1992) and the advocacy coalition approach (Sabatier and Jenkins-Smith, 1993), have also been drawn upon to analyse and understand change and stability in institutions (Arts and Leroy, 2006).

In a field largely dominated by Dutch authors, these critical and interpretative researchers observe that despite the range and quality of these post-positivist studies of public policy, they are still almost always relegated to the periphery of the discipline, not yet constituting a viable alternative to traditional, scientific policy analysis (Hajer and Wagenaar, 2003). Although sidelined in the Netherlands, interpretative research on water management had not even appeared on the side lines in England by 2007, in a literature strongly based on realist assumptions. Convinced by a review of the literature and previous research, and by the need to “avoid one-sided approaches that do not do

justice to the complexities of social reality” (Leroy and Arts, 2006), my research will draw heavily upon the tradition of the interpretative analysis of policymaking, using concepts and theories largely ignored by mainstream researchers and policy analysts in the field. Within the remainder of this chapter I seek to develop a framework to advance a theoretical understanding of institutional dynamics in environmental policy, by combining general propositions in institutional theory (section 3.2) with the structuring character of hegemonic discourses (section 3.3), the concepts and approach laid out in particularly inspired by the work of Marteen Hajer (1997) and Frank Fischer (2003). It would appear in the first year of the research, 2007, that the ‘shifts in governance’ thesis could only be verified at the level of policy discourse and at a practice level, the traditional policy response prevailed - development on floodplains and flood defence to protect that development. Finally, influenced by interpretative researchers from the Netherlands (including Arts and Goverde, 2006; Arts and Van Tatenhove, 2006; Crabbé and Leroy, 2008; Leroy and Arts, 2006; Van der Zouwen, 2006; Wiering and Crabbé, 2006), who paid particular attention to interpreting innovation and tradition in environmental policies, I will adapt and extend their ‘policy arrangements approach’ to comprehensively describe and analyse both the nature and magnitude of institutional change, or continued stability, in the restoration of floodplains to the present point in time – September 2012 (section 3.4).

3.2 Institutionalism

The quintessence of an institutional evaluation, according to Leroy and Arts (2006), is to understand if the institutional context is suitable and adequately equipped for the type of policy to be pursued (Leroy and Arts 2006). The institutional phenomenon of policy making concerns the dominant view of the policy field and definition of the issues at stake, what the central tasks involve, who the principal actors are and the relationships between them, the distribution of funds, knowledge and power and crucially how policy is implemented (*ibid*). If newly proposed, more ‘sustainable’ and integrated environmental policy approaches are not attuned to the context or vice versa, then the chances of achieving effective policy can be greatly compromised (Crabbé and Leroy, 2008). Basically, if the resources, knowledge, power, legitimacy are not available or if the actors (including from government organisations, the public and private sector) are not in favour of a particular policy action, then policy implementation can be hindered

or distorted (*ibid*). Many policy fields are characterised to a large extent by stable relationships between these contextual factors, that is who the actors involved are, accepted views of who the principal actors amongst these are and the balance of power between them, as well as the boundaries with adjacent policy fields. There can be more or less fixed and stable patterns of behaviour, divisions of tasks and the stabilisation of the ‘rules of the game’ (Crabbé and Leroy 2008; Leroy and Arts, 2006). Some of these institutional patterns can ‘solidify’ and thereby constrain political behaviour and create mechanisms of path dependency that agencies cannot easily overcome (Arts and Goverde 2006). Solidified policy domains can thus result in actors being badly prepared for engaging with the new environmental policy issues and problems that emerge and the responses required (Crabbé and Leroy 2008). Research undertaken on the institutional basis of environmental policy has uncovered policy fields and domains that over the years have established ways and styles of policy-making that may have become rigidly ‘institutionalised’– the way in which the specific policy process unfolds is pre-structured and characterised (*ibid*). Some of these institutional patterns are continually being reproduced and consolidated, and prove very resistant to change (*ibid*).

The Reconstruction of a Policy Domain

‘Institutionalisation’ is a basic concept from classical sociology, the debate having been renewed by the concept of ‘neo-institutionalism’ in the 1980s and 1990s (Arts and Van Tatenhove, 2006). When the sociological concept of institutionalism is applied to policy processes, it refers to the gradual stabilisation of common perceptions and definitions of problems and approaches, of strategies and solutions in and around specific policy domains (Leroy and Arts, 2006). Institutionalism: “the phenomenon that human behaviour gradually becomes fixed in its responses and actions. Ideals, norms and opinion, on the one hand, and practices and ways of going about things, on the other, slowly converge in broadly shared views that need no further explanation; in fixed operational methods that are accepted and adopted by all; and in rules and structures that would appear to be undisputed” (Crabbé and Leroy, 2008, p18).

The introductory chapter to the thesis has described a major shift in problem formulation in ‘flood risk management’, with the recognition that we cannot continue with the strategy of flood ‘defence’, instead new ‘integrated’, ‘sustainable’ environmental strategies have emerged. As stressed by Crabbé (2008), “we witness institutional

challenges here that ask for institutional responses” (p20). Yet, does the theory of ‘institutionalism’ explain the alleged stabilisation of the traditional policy arrangement; the centuries-long tradition in construction of flood defences in England? The key research question concerns whether more recent discourses on natural approaches to flood risk management, notably floodplain restoration, can translate from policy rhetoric into mainstream practice. Institutionalism theory does in fact focus on the *temporary* character of stabilisation, as it considers the ongoing process of construction and reconstruction of the organisation and substance of a policy domain (Van der Zouwen, 2006). New ideas, actors, rules and resources can emerge in policy domains and it is possible that these can change existing ideas, result in new coalitions, affect existing rules and resources. In turn, sometimes such changes can become patterns themselves, whereby the new problem definitions become stable, the new division of responsibilities and interactions between actors become routine in nature (*ibid*).

The Structure-Agency Duality

Hajer (1997) states the common sense of the sociology of knowledge these days is that institutional structures are both constraining and enabling, research should therefore focus on the interaction between structure and agency. The question of structure–agency is considered to be by some authors to be the most important theoretical issue within the human sciences (McAnulla, 2002; Arts and Van Tatenhove, 2006). Drawing on classical sociology, the structure–agency duality has been somewhat caricaturised in a Durkheim-Weber opposition (Leroy and Arts, 2006). ‘Agency’ refers to an individual’s or a group’s intentions, reasons and motives and their abilities to affect their environment and produce structures, whether this is intentional or not (Arts and Van Tatenhove 2006). ‘Structure’ refers to the context, that is the institutionalised or rule directed character of these actions, the material and ideational conditions which guide and constrain the behaviour of actors in their social practices (*ibid*). Giddens (1979, 1981, 1984) has addressed the actor-structure duality in his ‘structuration theory’, as a reaction to an enduring dualism in the social sciences between theories which he argued were ‘strong on action, weak on institutions’ on the one hand and theories which were ‘strong on institutions, weak on action’ on the other (Arts and Van Tatenhove, 2006). Giddens does not consider structure and agency to be independent phenomena. He conceives that there is bounded rationality, routine behaviour, institutional embeddedness, unknown preferences and unintended consequences in agents, but he

also assumes that agents are knowledgeable and capable (Giddens, 1984). Intuitionism is thus linked by Leroy and Arts (2006) to wider ‘grand’ structural transformations, such as ‘shifts in governance’. Institutionalism is the phenomenon whereby over time, day to day actors’ behaviour solidifies into patterns and structures, and then these patterns in turn structure day to day actors’ behaviour. Shifts in governance can cause structural transformations, which can both enable and constrain the action of actors and may, or may not, have effects on day-to-day policy practices (*ibid*).

Thereby, through operationalisation of the concept of institutionalism, there is the potential for to analyse whether or not the recent developments in flood risk management policy, focusing on floodplain restoration, are becoming embedded, co-existing or replacing existing flood defence policy arrangements – that is, becoming institutionalised themselves.

3.3 The Institutional Dimension of Critical Discourse Analysis

‘Discourse’ has many different meanings for many different people. The everyday meaning of discourse is synonymous with discussion or a mode of talking. In the academic sense, discourse is most often conceived as an extended stretch of connected speech, writing or otherwise a ‘text’, whereby ‘discourse analysis’ attends to the micro analysis of that text (Hajer, 1997; Van Leeuwen, 2009). In the approach taken in this thesis, discourse analysis is not intended to investigate linguistic units per se, but instead stems from the post-positivist interpretative tradition. Discourse is a ‘socially constructed’ way of ‘knowing’ some aspect of reality, internally related to the social practices in which it is produced (*ibid*); “Discourses do not merely reflect reality, rather discourses not only shape but even enable social reality” (Jeger and Maier, 2009, p36).

‘Critical’ Discourse Analysis

‘Critical’ discourse analysis is problem orientated, interested in studying complex social phenomena. This form of analysis has been chosen for the thesis, as it is geared to a better understanding of the social phenomena, any obstacles to addressing ‘problems’ and possible ways of overcoming the obstacles. Wodak and Meyer (2009) stress that the term ‘critical’ does not necessarily mean ‘negative’ as in common-sense usage, instead

any social phenomena can lend itself to critical investigation “to be challenged and not taken for granted” (p 2). The critical perspective of discourse analysis is influenced by the Frankfurt School and Jürgen Habermas. ‘Critical Theory’ in the sense of the Frankfurt School directs social theory to critiquing and changing society, in contrast to traditional theory that is orientated to understanding or explaining it (Wodak and Meyer, 2009). In common with many ‘critiques’, critical discourse analysis aims at revealing structures of power and unmasking ideologies and seeks to achieve this through an understanding of how language functions in constituting and transmitting knowledge, in exercising power and in organising social institutions (*ibid*). Critical Discourse Analysis aims to “disentangle the giant milling mass of discourse” to chart what is said, can be said and how it is said in a given society at a given time (Jäger and Maier, 2009). It also aims to uncover the techniques through which these discursive limits are either extended or narrowed down (*ibid*).

Critical Discourse Analysis needs to be integrated within theoretical frameworks for transdisciplinary research, a variety of relevant theories can be drawn upon to go “beyond and beneath the obviousness of the topic” (Fairclough, 2009, p169). Fairclough (2009) explains, “there are no ‘right answers’ to the question of which theoretical perspectives to draw upon”, instead it is the responsibility of the researchers to make a judgement on the concepts and perspectives that can provide a rich theoretical basis to deepen understanding of the research phenomenon at issue and (particularly for critical research), the implications for improving well being (p169). Central to Jäger’s (1997) argument on discourse analysis, is that it should not be defined in contradistinction to an institutional analysis, it is “rather a different way of looking at institutions that is meant to shed new light on the functioning of those institutions, how power is structured in institutional arrangements, and how political change in such arrangements comes about” (p263). Jäger (1997) is inspired by Foucault in his institutional dimension of discourse, which he defines as “a specific ensemble of ideas, concepts, and categorisations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities”. Jäger (1997) has sought to understand where things are said, how specific ways of seeing can be structured or embedded in society, at the same time as they structure society. His approach complements the first concept of ‘institutionalism’ in that he has also sought to show not only how discourse constrains action, but also

opens ways to recreate society and how specific ‘solidified’ discursive commitments can be ‘dissolved’. Hajer has, in fact, suggested that the very nature and the outcome of the wider ecological conflict are dependent on discursive dynamics (Hajer, 1997).

Knowledge and Ideology

‘Knowledge’ is all kinds of meanings that people use to interpret and shape their environment, from every day knowledge that is transferred through everyday communication and the media, in addition to scientific knowledge (Jager and Maier, 2009). People derive their knowledge from the discursive surroundings into which they are born and in which they develop throughout their lives. Knowledge therefore depends on people’s location in history, geography, class relations and other such factors (*ibid*). Critical Discourse Analysis aims to identify the ‘knowledges’ that are contained in discourses. Jager and Maier (2009) state that a discourse with its recurring contents, symbols and strategies leads to the emergence and solidification of ‘knowledge’ and therefore has sustained effects. What is important is not the single text, the single film and so on, but the constant repetition of statements.

Ideology is defined by political scientists as a coherent and relatively stable set of beliefs or values. Day to day, certain ideas arise more commonly than others and quite frequently, people with otherwise diverse backgrounds and interests can find themselves thinking alike in many ways (Wodak and Meyer, 2009). These dominant ‘ideologies’ appear as neutral and contain assumptions that stay largely unchallenged, or as Wodak and Meyer (2009) state “when people in a society think alike about certain matters or even forget that there are alternatives to the status quo, we arrive at the Gramscian concept of ‘hegemony’” (p8). Rather than the ideologies on the surface of culture, it is the more hidden and latent type of everyday beliefs and functioning of ideologies in everyday life which interest discourse analysts.

Hajer’s (1997) argument is that developments in environmental politics depend critically on the social construction of environmental problems. An understanding of discourse involves making sense of the regularities and variations in what is being said (and indeed written) and tries to understand the social backgrounds and the social effects of specific modes of talking (Hajer, 1997). Following ‘shifts in governance’, the flood risk management policy domain, now brings together a variety of actors to work in

partnership. As observed in other domains, these actors all bring their own legitimate orientations and concerns to the policy table with their own elements of knowledge, ideology and modes of talking (Hajer, 1997). These knowledges and ideologies may have made perfect sense within the original discipline or professional discourse in which they were constituted. However, as Hajer (1997) makes clear, “they then subsequently become an element in a debate that is conducted by a far more diverse group of actors and in the context of acts and practices that do not function according to the discursive logic of that original discourse”.

Power

Critical discourse analysts are also interested in how knowledge and ideology are connected to power relations (Jager and Maier, 2009). Agents that strive for power will try to influence the ideology of society to become closer to what they want it to be (Wodak and Meyer, 2009). Power is a central concept in the critical discourse analysis approach (as in institutionalism, section 3.2). Although as Wodak and Meyer (2009) explain, there are as many concepts of power as there are social theories. The classical Weberian definition describes power as “the chance that an individual in a social relationship can achieve his or her own will even against the resistance of others” (Weber, 1980, p28 in Wodak and Meyer, 2009). The definition of power in this thesis, stems from the theoretical insights of Foucault, who is concerned primarily with overall structure in social fields and not individual resources. Foucault’s concept of power remains mostly invisible, but can manifest itself through discourse by the regulation of ways of talking, thinking and acting (Jager and Maier, 2009). In fact, literary and cultural scientist, Jürgen Link (1983) defines a ‘discourse’ as “an institutionalised way of talking that regulates and reinforces action and thereby exerts power”.

The power of discourse materialises by the fact that discourses delineate a range of statements which are sayable, and thus they simultaneously inhibit a range of other statements which are not sayable (Link and Linkheer, 1990 in Jager and Maier, 2009). If discourses are seen as flows of knowledge through time, they determine the way in which a society interprets reality and organises further discursive practices, that is further talking, thinking and acting (*ibid*). In this way they form individual and mass consciousness. Secondly since consciousness determines action, then it thereby follows that discourses determine action. Action creates materialisations, and therefore

discourse guides the creation of reality. This leads to the quote by Jager and Maier (2009) in the opening paragraph of this section; “discourses do not merely reflect reality, rather discourses not only shape but even enable reality” (p36). Different individuals and groups have different chances of influence or ‘power’ over discourse because, for example, they have privileged access to the media or greater financial resources (Jager and Maier, 2009). Yet even the most powerful, cannot have full control over discourse or can precisely control the final result, discourses can take on a life of their own as they evolve (*ibid*). Although it is not possible for other powerful politicians and other groups to simply defy dominant discourse, over the long run changes in discourse can be accomplished. Therefore, although discourse can constrain action, new competing discourses can also be used to dissolve particular solidified discursive commitments and bring about political transformation and change (Hajer, 1997).

Probing ‘Mind Sets’

Before the influential work of Hajer, it was rare to operationalise the work of major theorists, such as Foucault, in contemporary environmental policy analysis and evaluation (Hajer, 1997). Drawing upon the theoretical perspectives of critical discourse analysis, an analysis can be undertaken on how institutional practices in the flood risk management domain work by identifying policy-discourses. Actors mobilise around environmental policy issues and socially construct varying ideas and concepts. Thereby through the analysis of ‘discourse coalitions’, that is the formation that has shaped up around a certain social construct of the problem, and the coalitions’ ‘story lines’, it is possible to reveal the common understandings of the flood risk ‘problem’ and thereby ‘solution’ and signpost for ‘action’ within institutional practices (Hajer, 1997). Section 1.2 to 1.4 of the thesis outlined the alleged traditional engineering attitudes, mind sets and ‘ideologies’ of water managers, and how this ‘substantial constraint’ to the implementation of floodplain restoration policy is currently bypassed in the UK literature. Section 3.2 described how a ‘solidified’, institutionalised policy domain rested on not only policy rules, but also the dominant view of the policy field and definition of the issues at stake, and more so the distribution of this knowledge and power. Discourse analysis will be coupled with ‘institutionalism’ to gain a deeper understanding on how power is structured in a policy arrangement. Why has one framing of the flooding issue at a certain point in time gained influence and dominance, been seen as authoritative and hence ‘solidified and institutionalised? Whilst, how and why have other

concepts and understandings (possibly from other disciplines or professions) been discredited? Furthermore, can the traditional, dominant discursive commitments be ‘dissolved’ leading to the institutionalisation of floodplain restoration?

Having outlined the pivotal theoretical concepts for the research, shifts in governance, institutionalism and critical discourse analysis, the next section of the chapter concerns the operationalisation of these concepts for empirical research, in order to analyse and understand change and stability within the flood risk management policy arrangement.

3.4 The Policy Arrangement of Fluvial Flood Risk Management

Dutch researchers working in the interpretative tradition (including Arts, 2000; Leroy and Arts, 2006; Liefferink, 2006; Van der Zouwen, 2006; Wiering and Crabbé, 2006) have developed an analytical framework to analyse recent changes and patterns of stability in environmental policies, linked to the contemporary broader, structural changes of political modernisation. This they term the ‘policy arrangements approach’. The main goals of the policy arrangements approach are to:

1. Describe and characterise policy arrangements and;
2. To interpret and understand their relative stability or change, and the mechanisms behind these dynamics.

Based on the institutionalisation concept, the inference is that day to day policy processes and interactions between the agencies involved gradually develop into more or less stable patterns, labelled ‘policy arrangements’ (Leroy and Arts, 2006). Policy arrangements are the temporary stabilisation of the content and organisation of a particular policy domain, which includes the substantive delineation of the problem at stake, of possible solutions, the processes of give-and-take between the actors concerned and the formal and informal rules according to which these processes take place (Liefferink 2006). The structures thus formed shape subsequent behaviour, *but* the structures are not fixed, they can be gradually changed (*ibid*). Liefferink (2006) describes the structure of policy arrangements to be like language, “speakers of a given language may gradually adopt new grammatical or syntactical rules, or invent new expressions. They are not able, though, to change the entire language at once” (p47).

The analysis will only make sense if it is comprehensive and encompasses all four dimensions of a policy arrangement, these dimensions are: actors/coalitions; resources/power; rules of the game and discourses. As the four dimensions are strongly interrelated, a change in one of the dimensions is likely to lead to changes in one or more of the other dimensions (*ibid*). The analysis may start with any of the dimensions, the starting point is considered important as it sheds a different light on the policy arrangement. This depends on the research questions underpinning the analysis and directs the choice of conceptual and methodological tools (or vice versa) (*ibid*).

At the beginning of the journey for the PhD research I had detected discursive renewal in the water policy domain raising the need for a more sustainable approach to flood risk management – including the need to restore naturally functioning floodplains rather than persist with traditional, engineered flood defences. In line with shifts in governance, the renewed policy discourse also emphasised the need to share responsibility and integrate with other sectors and agencies, including new responsibilities for spatial planning. ‘Mind set’, which we can now see as ‘ideology’, is commonly cited as a barrier to floodplain restoration, yet receives little attention in the literature. Discourse will be taken as the starting point, to further understand how actors involved in the policy arrangement of flood risk management delineate the character of the flood risk management ‘problem’, its causes and possible solutions – to continue with traditional structural solutions or more innovative solutions including restoring naturally functioning floodplains.

Discourse Position and Coalitions

A discourse position is the ideological position from which actors, including individuals, groups and institutions, participate in and evaluate discourse (Jager and Maier, 2009). As section 3.3 explained, the reason actors develop a discourse position is because they are ‘enmeshed’ in various discourses, that they have been exposed to in the course of their life and have worked them into a specific ideological position or ‘world view’ (*ibid*). This can also work in reverse, whereby discursive positions contribute to and reproduce the discursive enmeshments of actors (*ibid*). Policy discourses are the interpretive frameworks that concern the specific norms, policy problems and solutions which are shared by actors (Van der Zouwen, 2006). They can range from formal policy concepts to popular story lines and actors will draw on the discourses to understand and give

meaning to the policy domain (*ibid*). The discourse dimension aims to capture the substantive character of the arrangement; this implies the substantive strategic positions of actors in the arrangement. Or as Liefferink (2006) terms it, the ‘concrete’ policy problem at stake (in this case, literally concrete), which is the character of the problem, its causes and possible solutions. Discourses can also have relevance at a second level, concerning general ideas on the organisation of society and in particular, modes of governance (*ibid*). Liefferink (2006) describes the dimension of discourses as being interesting to study the empirical effects of political modernisation, in other words the changing ideas about governance. These ideas may have an impact on specific policy arrangements through the views of the actors concerned, and have important implications for the rules of interaction in the arrangement (Liefferink, 2006).

The policy arrangement approach makes the assumption that there is a dominant discourse present in the arrangement and that it is actors that advocate policy discourses within the arrangement (Van der Zouwen, 2006). Actors may group around one particular discourse in a ‘discourse coalition’. This thereby means that a dominant policy discourse can be challenged by actors or a coalition which advocate competing discourses (*ibid*). Therefore, at a practical level, using ‘discourse’ to enter into the policy arrangement can aid an analysis of the role of changing problem perceptions, induced, for example, by new scientific insights (Liefferink, 2006). This is useful, of course, to aid an analysis of the changing problem perception of flood risk management. If actors are driven by conflicting ideas, then new developments may be prevented and the policy arrangement paralysed (Liefferink, 2006).

Policy discourses, entailing the ideologies of the actors involved (definitions of problems and approaches to solutions) are inextricably connected to the other dimensions of a policy arrangement:

- a) the *actors* and their *coalitions* involved in the policy domain;
- b) the division of *resources* between these actors, leading to differences in *power*;
- c) the *rules of the game* within the arrangement, in terms of formal procedures of decision making and implementation or as informal rules and ‘routines’ of interaction.

For example, new discourses such as ‘sustainable development’, through their connection with the other dimensions, may mobilise new types of expertise or legitimacy, in other words new resources, or form the nucleus of new coalitions (*ibid*).

Actors and Coalitions

Actors are organisations or individuals who are involved in the policy arrangement, government or non-governmental. A ‘coalition’ is a group of cooperating actors, who to some extent share resources (or are dependent on each other’s resources). Actors and coalitions can either support a dominant policy discourse, or it can be challenged by actors or a coalition who advocate competing discourses (Van der Zouwen, 2006).

Formal and Informal Rules of the Game

Rules concern the opportunities and barriers for actors in the policy process; they can be formal and informal. Formal rules are set out in legal texts including decrees, acts and in national policy norms. They also concern who is responsible for policy and the distribution of tasks. Informal rules, for example, could concern how policy culture is expressed in consensus building or setting agendas (Van der Zouwen, 2006).

Power, Resources and Influence

A policy arrangement can also be perceived as a system of power. Power, in this sense, concerns the ability to determine policy outcomes. It is an often durable, structural characteristic which involves the distribution of resources amongst actors. Resources can be formal or informal. Formal resources can include statutory duties to develop policy, knowledge (scientific), finances and property. Informal resources can include charisma, good relations and trust - important in bridging gaps between actors that are strongly opposed (Van der Zouwen 2006). With these resources, power is demonstrated by actors in striving for policy outcomes or blocking them. ‘Influence’ relates to the action of intervention, it relates to the process of how power is actually exercised in order to reach or obstruct policy outcomes (Van der Zouwen, 2006).

Crossing Concrete Policy Dimension Thresholds

Having analysed changes in integrated water management in both the Netherlands and Flanders, Wiering and Crabbé (2006) have developed a hypothesis on forces for change,

and the sequence of institutional change. This will be tested in chapter 7 (section 7.1), regarding institutional change in floodplain activity in England. They hypothesise that there are four policy dimension thresholds to cross for a novel discourse to institutionalise: firstly the rising of a new, counter-storyline, opposing the existing and hegemonic discourse; second threshold, the creation of an actor coalition that puts the new ideas into practice with sufficient independent resources to enforce its ideas; thirdly anchoring the new (at this point informal) policy practices into formal legislation or political rules of the game and the final and fourth threshold, that Wiering and Crabbé (2006) consider the most difficult to cross; changing power relations (see figure 3.1).

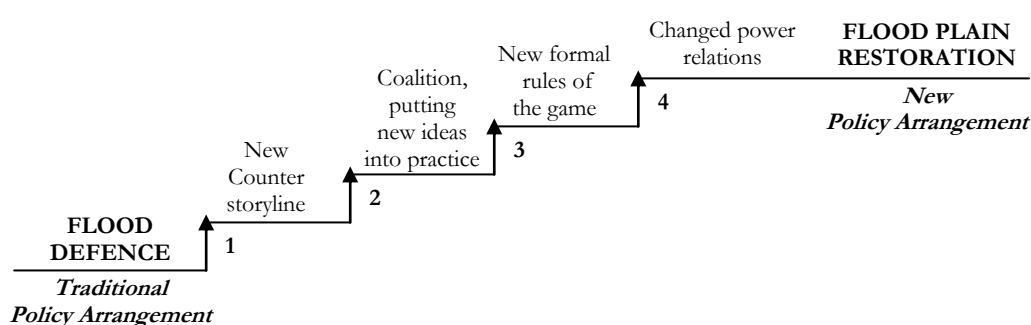


Figure 3.1: The Four Policy Dimension Thresholds for a Novel Discourse to Institutionalise

Wiering and Crabbé see the acceptance of a new discourse as, not surprisingly, easier when the ideas on the existing policy are disputed in the societal and political sphere. The addition of new rules is most often easier than adapting existing rules, this is because the latter would alter the existing, traditional power balance to a greater extent (*ibid*). Finally, to change power relations requires a combination of strong counter-coalitions in order to weaken existing coalitions. These counter-coalitions must have strong storylines, new rules of the game, a redistribution of resources and importantly, the assistance of endogenous and exogenous ‘forces of change’ that, when used strategically, make policy makers susceptible for fundamental institutional change (Wiering and Crabbé, 2006). Wiering (2006) describes forces for change as a form of ‘shock waves’ in society, such as a sudden disruption of the physical environment (e.g. flood event) or a political event. These forces can either trigger new or stimulate existing institutional changes, or cause further congestion in the development of a policy domain.

The introductory chapter hinted at ‘forces of change’, in climate change, increasing flood risk events and a political dissatisfaction with current, traditional practices of flood defence. Parts II and III of the thesis will now commence the empirical research. The practice of ‘floodplain restoration’ occupies centre stage, which represents and can be analysed as ‘shifts in governance’ (the need for cross sector integration and delivery of the multiple benefits of sustainable approaches). The structuring and stabilisation of floodplain restoration will be studied at the level of the ‘policy arrangement of fluvial flood risk management’, with a particular focus on water managers (engineers) and spatial planners. Having described the theoretical framework that will operationalise the case study design, section 3.5 concludes the chapter by relating the theory and analytical framework to the subject of this research, the policy arrangement of fluvial flood risk management in England, with the development of six main research questions to guide the research and test the hypothesis of Wiering and Crabbé (2006).

3.5 Research Questions

New forms of governance are called for in flood risk management, the new sustainable and integrated approach of floodplain restoration, epitomised in the emerging relationship between water managers and planners in making the necessary changes in land uses. By operationalising the concepts in this chapter to empirical research I seek to analyse and evaluate the policy arrangement of fluvial (rivers and streams) flood risk management, using the policy arrangement approach in order to attempt to overcome the limitations of classical policy evaluations’ methodologies. The emergence of the innovative discourse on floodplain restoration will be characterised, along with the discourse’s progress in crossing the ‘actor’, ‘rules of the game’ and ‘power’ policy dimension thresholds. In departing from the ‘rational’ science perspective I will be looking to add alternative perspectives from the social sciences to contribute to future planning policy making and practice to close the current implementation deficit. This leads to the development of six main research questions that will be used in the case study research to see if the theoretical concepts of institutionalism and discourse analysis ‘work’ in a ‘real world situation’ (De Vaus, 2001).

The following six research questions will inform and drive the policy evaluation in the final two parts of the thesis.

Part II Description and Characterisation

Q1 How and why did the discourse on flood defence institutionalise?

In the first stage of the empirical research, documented in **Chapter 4**, I will examine the historical roots of the ‘flood defence’ discourse, its ebbs and flows and the key forces and factors for its solidification.

Q2 How, why and from whom has the discourse on floodplain restoration emerged?

Chapter 5 picks up the historical discourse analysis from the 1980s, to trace the rise of ‘contesting’ voices, that is the emergence of new concepts on flood risk management, and nested within this, floodplain restoration. The circumstances from which the new discourse emerged will be analysed, including the key forces and factors for innovation (including shifts in governance), any new actors and ‘discourse-coalitions’ shaping around the flood risk problem, how they gained influence or ‘power’ in policy circles to reconstruct policy solutions and an acceptance of the new conceptual language.

Q3 Has the ‘window of opportunity’ been taken?

Chapter 6 tracks the discourse ‘live’ during the course of the PhD research, from 2007 to 2012, to ascertain if the ‘window of opportunity’ was taken following the 2007 summer floods, under the renewed attention for the restoration of functional floodplains.

Part III Interpretation, Prescription and Reflection

Q4 How and why, and to what extent has the discursive renewal in flood policy had institutional effects?

In **Chapter 7** the dynamics of the new discourse will be examined in order to see if concepts have been accepted and taken up in practice to bring about institutional innovations. The focus will be on how the actors construct the policy problems and thereby their solutions. Has late modern society led to the emergence of new coalitions, and from which sectors? Have there been changes in their patterns of interaction,

particularly a change in relationship between planners and engineers? The change or stability in the flood risk management policy arrangement will be assessed, including any force of change from the adjacent planning policy arrangement.

Q5 How and why is social science research of value in the integration of flood risk management and planning, in closing the implementation deficit for floodplain restoration?

Chapter 8 will reflect on the capabilities of the policy arrangement approach, theories of institutional change and the value of transdisciplinary research between the social and natural sciences to ‘shine a light’ on the policy implementation deficit from an alternative direction. Chapter 8 will also suggest prescriptive solutions and report on plans for dissemination and future research activity.

Part II: *Description & Characterisation*

Historical Discourse Analysis

4

Historical Discourse Analysis: the ‘Source’ of Flood Defence

*Insurance premiums will soar unless the Government gets tough on
planners who build on floodplains*

David Derbyshire, The Daily Mail, 2008

*Hopefully, the growing public and media pressure on planners to act more
responsibly will help to balance the influence of the developers*

Professor David Crichton, Chartered Insurance Institute, 2007

Strands of discourse have a history, a present and a future. In order to identify the knowledge and ideology behind a policy arrangement, the analyst “should keep an eye on history” and “reconstruct the genesis” of the topic (Jager and Maier, 2009). Chapter four first delves back to the 13th century (section 4.1), identifying the historical source of the flood ‘defence’ discourse, and from there its ebb and flow through the most important circumstances and processes that have conditioned its stability in the late 20th century. The key forces and factors will be identified, which have set out early institutional arrangements in water management, the way in which the problem of ‘flood risk management’ had been understood, how the dominant discourse had been produced, and how early institutional practices have become embedded in this. Chapter 4 answers research question 1 – how and why did the discourse on flood defence institutionalise?

4.1 The Genesis of the Flood Defence Discourse (1252-1930)

Lords of the Level

Due to the wet climate, broad physical geography and slowly sinking east coast, England once laid claim to extensive floodplains and ‘*swamps*’, the modern day ‘wetlands’. It is widely believed to be the Romans who first recognised the richness of the floodplain soils for agriculture, that is, if they drained the land and protected it from further inundation from flooding (Scrase, 2005), but researchers concur that the drainage and loss of wetlands and naturally functioning floodplains certainly began as early as 1252, when King Henry III issued a royal charter permitting the ‘Lords of the Level’ to levy rates on land occupiers in order to pay for flood defence and drainage channels on Romney Marsh in the South East of England (Scrase, 2005; Scrase and Sheate, 2005; Werritty, 2006). Initial action to drain the land was piecemeal and the majority of floodplains and wetlands survived through the following centuries as ‘common land’, supporting commoners through grazing, hunting and fishing activities (Scrase, 2005). In 1663, the London diarist Samuel Pepys described the “*most sad fennes*” and the “*sad life*” of its people and their “*breedlings*”, Purseglove (1988) providing further insight into traditional attitudes towards wetlands in England held by people living on ‘drier’ land, as “unfathomable, dangerous, disease ridden places, populated by backward peasants with a liking for drink and drugs”. The Dutch engineer, Vermuyden, oversaw drainage of the fens in the mid-17th century, although had faced years of wrecking and armed rebellion from commoners when he first experimented with his proposals near Doncaster in the North of England (Scrase, 2005). Although Oliver Cromwell defended the commoners in their dispute with the Crown over drainage of the southern Fens, following the civil war he returned to the Fens to oversee completion, in 1653, of the major channels that are still used today in the Ouse catchment. The British imperialist expansion through to the eighteenth and early nineteenth centuries witnessed further enclosure and drainage of common land by private interests (*ibid*).

‘Control’ of Unruly Rivers

In the first urban conurbations of the Industrial Revolution in 18th century Northern England, the Midlands and Wales, rivers supplied large volumes of water for steam-generation, for manufacturing processes and were altered to improve navigability for

carriage of raw materials and products (Eaton, 1989; Fish, 1970). In the industrialised areas of England, and in London, the situation of urban water resources during the 19th century and in the first half of the 20th century rapidly declined (Novotny *et al.*, 2010). Rivers were in effect used as sewers, industrial effluents and loads from newly reinvented flushing toilets were discharged without treatment, which resulted in water courses devoid of oxygen with putrid decomposing anoxic sediments (*ibid*). As urban water courses were also a source of potable water supply, as well as waste disposal, the effects of the uncontrolled river pollution were seen in widespread and disastrous outbreaks of waterborne diseases, including cholera (Eaton, 1989; Fish, 1970; Novotny *et al.*, 2010). Speaking of Coventry, Leppington (1907), described the hitherto ‘defective’ drainage of the ‘*insignificant stream*’ the Sherbourne that “*crawls through the town, and into this ‘inadequate channel’ the sewage of the city was discharged, to become a nuisance and sometimes a source of disease to the villages lower down in its course, and of litigation to the Corporation*” (p347).

The First Thames Embankment

From the seventeenth century to the nineteenth century, schemes to embank the River Thames as part of the redesign of the city and plans for civic improvement are evident in historic documents from the Corporation of London (1832, p13-18) and Parliamentary Papers (1799; 1844) as sourced by Geographer, Stuart Oliver (2000). The first Thames embankment scheme was introduced by Wren in the reconstruction of London after the 1666 fire (Parliamentary Papers, 1844, p8-15 in Oliver, 2000). Further schemes followed in the eighteenth and nineteenth century, for example, the Select Committee on the Port of London recommended embankments on both banks of the river from Blackfriars Bridge to London Bridge (Parliamentary Papers, 1799) and John Nash deployed embanking as part of his improvement schemes for London (Barker and Hyde, 1982; Porter, 1998 in Oliver, 2000). The rapid growth of London’s population, from 1.1 million in 1800 to 2.7 million in 1850 (Mitchell, 1992 in Oliver, 2000), accompanied by an increase in industrial effluents and use of the ‘water closet’ to flush away dirt with clean water, provoked a water pollution crisis, including cholera epidemics from the 1830s to the 50s and culminating in the ‘Great Stink’ of 1858 (Halliday, 1999 and Shepherd, 1971 in Oliver, 2000). The consequence of a perceived ‘congestion crisis’ in nineteenth-century London, and the desire to allow the uncongested flow of people and goods in the accumulation of capital, drove the consequent demand to improve navigation on the river and provide new roads, both

provided by an embankment scheme (Oliver, 2000). ‘Lone voices’ did express concerns in Parliament, questioning whether the embankment might promote flooding or cause a migration of the river’s channel ((Hansard, 1862, 1862a in Oliver, 2000), but arguments centered on how the embankments would be built, rather than questioning their need to exist per se.

One notable objection to wide spread engineering ideologies was however evident in the mid 19th century with the English sanitary reformer Edwin Chadwick, public health official (1848-54) and author of the famous report of an ‘Inquiry into the Sanitary Condition of the Labouring Population of Great Britain’ (1842) (Hamlin, 1992). Although highly influential in administrative structures and with new technologies such as indoor running water and water closets, his relations with engineers were described as “wretched”. He saw mid-century British civil engineers as part of the problems, not the solutions; “*both loyal to a primitive laissez-faire and in cahoots with the most corrupt and irrational institutions of local government: the ancient municipal corporations, sewers commissions, and navigation trusts*” (*ibid*). Chadwick represented engineers’ works as hyper expensive, uninformed by science, even dangerous. Worse, they clung to obsolete doctrines and rejected truths from outsiders (*ibid*, p680).

The Country at the Mercy of Foreign Speculators

Back in rural territory, in 1861 a Land Drainage Act was passed with respect to sea defence and land drainage work (The National Archives (TNA) n.d.) “*with the object of facilitating and cheapening enquiries by having them conducted on the spot by skilled inspectors under the Enclosure Commissioners*” (The Times, 1863). An anonymous letter to the Times, 1863, would suggest that some opposition to drainage continued. The letter detailed the experience of an owner of a “*certain swamp of 2,000 acres called Mordon Carrs, over which the railway is carried between Darlington and Durham....tempted by the ability and cheapness of the tribunal offered by the Land Drainage Act, sought to avail themselves of it*”. The provisional order had been referred to (an expensive) select Committee in the House of Commons. The letter declared the Act a “*dead letter*”; and the idea of a “*cheap inquiry on the spot*” a “*snare, mockery and delusion*”. The owner, the author declared, should have stuck with the old way before Parliament to seek to weigh down the opposition by “*length of purse*” and “*it were well to change the title of the new Act, and call it one for Discouraging the Drainage of Land for Agricultural Purpose’s*” (*ibid*). From the mid-nineteenth century, the newly powerful

industrialist class discovered the merits of free trade, the repeal of the Corn Laws in 1846 opened British markets to imported agricultural produce, contributing to low investment, deterioration in drainage infrastructure and a depression in agriculture for over half a century. A Memorandum by the Chamber of Agriculture in 1926 exclaimed that *“unless sufficient food is produced in this country to act as a check upon the price of imports, this country is at the mercy of foreign speculators”* (The Times, 1926, p11).

4.2 Rivers as ‘Drains’ – the 1930 Land Drainage Act

It was this decline in domestic food production during the agricultural depression, vulnerabilities exposed by submarine blockades during the First World War, that led to the introduction of new institutional arrangements concerning land drainage in 1930 (Sheail, 2002). A Ministry of Agriculture commission was set up to look at the problem, and reported that the *“need for engineering works was urgent or this once rich agricultural area could be permanently lost and return irretrievably to its original condition of ‘swamp’”* (Sheail, 2002, p259). A Member of the Institute of Engineers, wrote to the Editor of the Times in 1930, *“it is by no means uncommon to find in the valley scores or hundreds of acres of otherwise good meadow or pasture land which are foul with rushes or other semi-aquatic plants but which might be restored to haying, stock raising or dairying conditions if only the natural drainage arteries were conditioned to void the water in a sea ward direction”* (Clayton, 1930). The recent Royal commission of Land Drainage had estimated that there were 476,000 acres of land in England and Wales *“capable of improvement by means of small drainage schemes for the clearance of main ditches and other small watercourses”* (p20). However, due to the financial constraints on government and its inability to support industry it was not considered politically acceptable to provide direct support to agriculture. Sheail (2002) notes that Lord Bledisloe, the Royal Commission’s chairman, considered that financing river engineering could more easily be justified.

From ‘Lords’ to ‘Boards’

In 1930 the Land Drainage Act consolidated all previous legislation, establishing for the first time a code of law relating (and restricted) to land drainage and making increased financial resources available to encourage the activities of drainage authorities (TNA, n.d.). The Act created 46 Catchment Boards with powers to levy local governments and permissive powers to carry out ‘arterial drainage’, that is flood defence engineering

works, on main rivers. Internal Drainage Boards (IDBs) were given powers to levy rates on land within designated wet lowland districts and permissive powers to enter land and carry out works on smaller rivers and drains. Local authorities were given similar powers to deal with other non-main rivers outside the wet lowland districts. A system of grant aid for new capital works was also created, overseen by the Ministry of Agriculture. Until this time flood defence and land drainage had been predominantly a profit-seeking private enterprise, financed by the direct beneficiaries under a ‘no benefit, no rate’ principle that had been laid down in the sixteenth century. The 1930 Act gave drainage authorities permissive powers to enter and carry out channel works on land owned by others, landowners being compensated financially if any of their land was used in providing defences, even in places where they were the sole beneficiaries. The Government’s Record was discussed in the House of Commons in December 1930, where in the “*time of national crisis*” and “*the vital necessity of national economy and the immediate curtailment of national expenditure*”, the Land Drainage Act headed the list of prospective expenditure:

(a) Land Drainage Act	..	..	£20,000,000
(b) Consumers’ Council Bill	..	..	£20, 000
(c) Education Bill (School Age)	..	..	£8,000,000
(d) Housing (No. 2) Act	..	..	£230,000*

<p>£20,000,000 = £1 billion in 2012 (using the Retail Prices Index (RPI) inflation measure)</p>

*Per year for 40 years

(The Times, 1930, p15).

The Assistant Secretary of Agriculture and Fisheries, in an explanation of the Land Drainage Act, 1930, at the Chartered Surveyors’ Institution said that the Act “*provided the necessary machinery for securing that in future all the waterways and drainage channels in England and Wales could be kept in a proper state of efficiency*”, and whereas in the past the main rivers (into which all lesser streams ultimately discharged) had to a large extent been neglected, they could now be adequately considered. Whether advantage would be taken to the fullest extent of the powers depended upon the cooperation of all the various authorities, some of whom were now for the first time called upon to share in the responsibilities of “*one of the most important services in connexion with agriculture*” (The Times, 1930).

Contesting Voices to 'Laissez-Faire' Engineers and Boards

Following the extensive expansionist strategies that had been employed in the eighteenth and nineteenth centuries, the National Trust was founded in 1895, the Society for the Promotion of Nature Reserves (SPNR) in 1912 and the Council for the Protection of Rural England (CPRE) in 1926 (Luke, 1995). In 1930, the Chairman of the latter organisation, the Thames Valley Branch of the CPRE, thought it “*obvious that the works of enlarging and straightening the river, now being carried out by the Thames conservancy.....will merely result in increased volumes of water being brought more rapidly into the non-tidal river, just at those times when it will constitute a grave danger*” (The Times, 1930, p10). Referring to the “*extensive drainage provided for in the Land Drainage Act of this year*”, he noted that “*there will be not only a great and undesirable increase of water poured off the land into the river, but water, which, in the course of nature, soaks through the land and replenishes the all important natural underground reservoirs will disappear. The wells all over the country on which the population largely depend for water, and which even now are not infrequently dry, will cease to produce adequate supplies. From these considerations it would seem proper to conclude that land drainage should not be encouraged*” (ibid).

.....Including Sir Patrick Abercrombie

Patrick Abercrombie of the Department of Civic Design, School of Architecture, University of Liverpool in 1934 commented upon the River Wye Catchment Board's proposal to “*remove all obstructions to a headlong course of the river into the sea: bends, islands, weirs, breakwaters overhanging trees, &c., are all to go. The prevention of flooding is presumably being undertaken to safeguard those places which, through faulty town planning in the past, have allowed some of their houses to be located below the danger line of floods. It is a duty which the Catchment Board must certainly face. But is this canalizing of the river the only method? The Ministry of Health is at this moment trying to conserve the water supplies of the country, and the natural overflowing of the river is one of the most important means of replenishing our underground supplies - is it sound economy to rush this water direct to the sea? Flood meadows should be regarded not only as the feeders of springs, but as Nature's safety valves, retarding flooding in the lower reaches; and I believe that the canalization policy on the Thames will some day cause worse floods than ever in London when down-stream rush meets with an up stream tide*” (The Times, 1934, p13). Abercrombie pointed out the alternative policy “*to increase the capacity of the flood meadows.....As for those towns that suffer from floods, local protection (greatly aided by the safety-valve of the flood lakes) could be planned and the*

precaution in clearance schemes taken not to rebuild below the danger line. I trust that the Minister of health has his eye upon this attack upon our river-valley water supplies which is being made by these grandiose engineering schemes of the Catchment Boards, whose name seems to be singularly inappropriate to their policy of losing instead of catching heaven's precious water" (ibid).

4.3 Early Town and Country Planning's Relationship with Water

In 1909 'town and country planning' was born from the public health legislation of the preceding century. The first piece of legislation to distinguish general planning from housing was the Town Planning Act 1909 (TNA, n.d.). The prospect to govern the future development of a town, Unwin (1908) believed was "*an event of unique importance in its history. By this plan the future of the town must to a very great extent be determined, its success made or marred to a degree almost irrevocable. It is of the utmost importance that this plan should not be hurriedly prepared, that it should be based on complete knowledge of all the circumstances affecting the town and its development, that, in fact, it should be the very best plan which human art and forethought can create after most careful consideration of all the local conditions of the existing town and of the sites to be developed*". He continued that "*in these days of hurry and of competitions*" there was a tendency for plans to be prepared without sufficient study of the conditions, which "*in the case of a town plan, which must determine the lines of development of the whole town for the next generation, the harm would be incalculable*" (ibid). Unwin (1908) emphasised that the preparation of plans should come at the end rather than at the commencement of the proceedings, noting that the order of procedure in the Bill was "*not the one most likely to secure the best result*" (p16). He highlighted that the preparation and submission of the plans were placed first, and it was only after the scheme was prepared that the opportunity for the Local Government Board to "*bring to bear upon the scheme the influence of the expert knowledge of town planning*", was presented. This was seen as difficult for municipalities to achieve, as town planning was "*a new art in this country. Technical literature on the subject in the English Language may be said to be non-existent*" (ibid, p16). Listed within the kind of information suggested by Unwin as desirable to have *before* attempting to prepare a plan for the future development of an existing town, the lines of drainage and water supply, particulars of existing waterways, particulars of places of special beauty, together with "*such points as a prospect of sea, riverfront.....which it is important to preserve or provide for*" (ibid).

Zoning on the Floodplain.....

Having protested against the River Wye's Catchment Board's canalization policy in 1931, a few years earlier in two works seen as representing the latest development of the town-planning movement, 'detailed zoning', Abercrombie had facilitated development on floodplains on Deeside, Chester and Doncaster. On the River Dee's floodplain, Abercrombie and Fyfe (1923) reported upon zoning of lower land below 50-feet for unrestricted industry. The allotment was based on the fact that "*this position places the factories down near the waterways and railways and by flat roads, and thus in the most suitable places for the movement of their heavy raw materials and products. Also these lower areas are the most difficult to drain, and are unsuitable for residential development*" (1924, p441). It is notable that the report observed that "*below Chester the Dee has been straightened and embanked for a few miles, and here, in Sealand and Saltney, are areas of fertile meadow liable to severe flooding*" (*ibid*). It was stated that such land was only suitable for heavy industry if it was possible to obtain firm foundations for the buildings, railways and roads required. The authors had proposed that the waste from the mines, quarries and furnaces "*should be spread on the sites allotted to such structures so as to provide the foundation and at the same time raise the ground above flood level. This method has been employed in the Middlesborough area; it is sound where sufficient supplies of such material are available, and it is useful in disposing of such waste without producing the ugly waste heaps which disfigure so much of Industrial Britain*" (p442). In Doncaster, Abercrombie and Johnson (1922) also dealt with the danger of coal extraction and consequent subsidence to below the level of high tide with the "*formation of marsh and interruption of drainage with a resultant production of unhealthy conditions*" by converting the area into "*another Holland of dyked meadows whose drainage is to be pumped up over the banks into the rivers or canals. The cost would be met by a tax on the coal raised*" (p442). The authors were congratulated by the reports' reviewer (Fawcett, 1922) on having produced "*valuable and practical suggestions for the utilization of the resources of each area and the betterment of the conditions of living therein*" (p442).

The large scale use of highly impermeable concrete and asphalt pavements in cities also dates to the first half of the 20th century (Novotny *et al.*, 2010). Further evidence that development had already encroached onto floodplains, and an early recognition of its wise avoidance, came following floods in London in 1928. The Minister of Health, Mr. Chamberlain had received a deputation from the London Labour Party, urging that there "*should be immediate inquiry into the causes of the flood and the means of preventing recurrence*"

(The Times, 1928, p14). It was suggested that the contemplated legislation relating to the town planning of built up areas should deal with the matter of limiting the “*use of basements for sleeping accommodation, at any rate in the riverside areas*” (*ibid*). In his reply, Mr Chamberlain said that it was “*easy to be wise after the event, but when an event comparable with the late flood has been without precedent for 700 years it was natural that no one should have anticipated its possibility*”. In dealing with the various points he did believe that the flood confirmed “*perhaps, the wisdom of some prohibition against the building of dwelling houses on land liable to floods*” (*ibid*). The absence of any warning that the floods were impending was also said to show the “*lack of coordination between the existing authorities in London, and suggested the necessity for a Greater London General Municipal Authority*” (*ibid*). Further early signs of the need for co-ordination, “*there is no London, as implying a city with definite boundaries, but there are several Londons.....There are not only police London and postal London but water London, drainage London, port London, electricity London, and traffic London* (Baker, 1927, p37).

.....and Off the Floodplain

In “Town Planning at Oxford”, a brochure issued by Raymond W. Ffennell in 1926, it was suggested “*that every growing town, and especially a town with the natural beauty and historical traditions of Oxford, should own large tracts of building land near at hand, so as to be able to control its future destiny*” and that “*every effort should be made to maintain, as open spaces and playgrounds, flood areas near the city, to preserve the natural beauty of the countryside*” (The Times, 1926, p15). Ffennell also urged that the City of Oxford would do well to take expert advice on all matters concerning town planning, “*its practice of not consulting architects or town planning experts must be wrong, and the few guineas that are saved are nothing in comparison to the opportunities that are missed owing to lack of knowledge and experience, and to the damage that is done*” (*ibid*, p15). Continuing in Oxford, members of the Garden Cities and Town Planning Association in considering various locations where the Oxford City Council had housing schemes in hand, also stated “*all the riverside land, liable to flood, should be reserved so as to be kept entirely free from building of any kind, as it was suitable neither for industry nor for residence and, therefore, the cost of reservation would be very little indeed.....The attention given in the plan to open spaces was not adequate, especially as a new industrial population was growing up in the city, if the low-lying land was reserved that would improve the situation* (The Times, 1926, p19). Two years later, following the major flood event that affected London in 1928, the Times Correspondent stated “*if the frost had come upon us this week we should almost have been*

able to skate around Oxford. The city itself, thanks to the wisdom of its earliest town planners and the skill of the Thames Conservancy in more recent times, has suffered little on this occasion from floods in the streets and in the basements of houses. The green belt, of which a good deal has been written during the winter, has been marked out by the flood, however, as if it were a recently drained moat, so that it is demonstrably clear, at least for a day or so, that this green belt, which it is the aim of the Oxford Trust to preserve in its present state, is a natural entity and not an artificial conception. To keep it so will be good economics as well as good town planning. Where the city has straggled carelessly across the belt the settlers have been taken by surprise and dispossessed. Elsewhere in Oxford the floods have had no terrors” (p9).

NB Plans had Contours

The report of the Berkshire Regional Town Planning Committee (1930), with representatives of the Berkshire County Council, Boroughs and Urban and rural districts recommended that permanent open spaces should be reserved and “*the prevailing natural tendencies in the Thames Valley area should be followed, and that above Oxford land falling below the 250ft contour should be kept free of any buildings other than those for agricultural purposes*” (The Times, 1930, p6). A section devoted to land drainage was considered worthy of special study “*in view of the various proposals now put forward for the prevention of floods. It is recognized that the whole region will be considerably affected by the provisions of the Land Drainage Bill when it becomes law....It is unquestionable that the underground reservoirs, from which 50 per cent of the statutory water companies in the region obtain supplies, are extensively supplemented by the percolation of flood waters from the rivers. Any drainage scheme must, therefore, allow additional waters to remain at least in the upper regions of the river for a definite space of time*” (*ibid*). Surrey County Council Health Committee in 1934 also called attention to the “*problem arising in various parts of the county from the erection of houses on land liable to flooding*”, this amounted to “*hundreds of houses erected in the county, in the last few years*” (The Times, 1933, p9). Section 89 of the Surrey County Council Act, 1931, provided that any local authority may, by order, prohibit or restrict the erection of houses on land liable to flooding, “*it did not appear, however, stated the report, that steps to exercise that power had yet been taken by any local authority in the county*” (*ibid*). One possible reason given for inaction by local authorities was “*fear of the legal position in declaring any particular area as sufficiently liable to flooding as to warrant prohibiting the erection of houses upon it*” (*ibid*). The Chairman of the council urged that while “*local authorities might get substantial rateable value from building developments on land liable to flooding, a*

different picture was presented when the county council was called upon, on grounds of humanity, to deal with floods in areas in which buildings for human beings ought never to have been placed” (ibid).

4.4 ‘Operation Flood’

To date ‘flood defence’ had been defined in relation to agricultural land drainage, but after initial resistance, attention began to turn to urban areas and the competing priority to protect life and property ‘*apart from farms*’ after devastating flood events.

Increased ‘Flow’ in the Flood Defence Discourse

In 1947 rapid snow melt caused widespread flooding in the Fens (East of England), the Thames reached record levels; “*inscribed on locks and walls of riverside inns and houses is the date 1894; when the waters have finally subsided new record levels will have to be marked for this year*” (The Times, 1947a, p2). Mr Atlee and Mr. Williams, Minister of Agriculture, announced measures for the relief of distress in the flooded areas in the House of Commons in March 1947 for “*these inundations...can only be described as a disaster of the first magnitude which cannot fail to have the most serious effect on our home food production this year*” (The Times, 1947b, p4). An emergency advisory committee composed of the “*main agricultural interests concerned*” was set up “*to face urgent tasks*” (ibid), and higher grants under the Land Drainage Act were to be given for repair work and drainage in the Fens. Members of Parliament noted “*several large schemes for diverting from the Fens the head waters of the rivers that drain the uplands have been prepared and a decision cannot safely be delayed. The expenditure in money and labour will be some millions of pounds, but this must be faced if thousands of acres of England’s most productive soil are to be effectively safeguarded against recurrences of this year’s flooding*” (The Times, 1947c, p5). The N.F.U. described the size of the job as “*that of a full-scale military operation*” (ibid), military language repeated in The Times as “*scores of Army lorries, in the bright glare of R.A.F. mobile landing lights....on the road lorries filled with furniture are passing W.V.S. and Salvation Army canteens coming into the area to give refreshment to the troops engaged in ‘Operation Flood’*” (The Times, 1947b, p2). However, Mr. Hogg, councillor for Oxford City, questioned whether it was satisfactory that the “*people in the townships concerned should be left simply to the local relief through funds organized by the mayors of the particular towns*” and that the Prime Minister should contemplate “*something in the nature of a national appeal having regard to the very widespread nature of the damage to homes apart from farms*” (ibid).

The debate commenced on the need for urban flood defences. The 47 catchment boards set up under the Land Drainage Act, 1930, were amalgamated into 31 river boards under the River Boards Act, 1948 and made responsible for land drainage and flood control, river pollution prevention, the maintenance and improvement of fresh water fisheries and, in a few cases, the maintenance of inland navigation (Fish, 1970). However, *“it is of some interest that a handbook of about 80 pages, issued by the Ministry of Agriculture and entitled ‘River Board: A Guide to their Powers and Functions’, does not include the word flood in its index. The explanation is, of course, that while legislation is concerned with creating river boards and empowering them to carry out land drainage, it is only in the application of that legislation – as, for example, in the preparation of schemes of land drainage by the boards – that such terms as flood level and flood protection come into use. Land drainage is still the main protection against flooding in our country. It would be extremely costly if river boards were to carry out schemes of land drainage including the erection of sea walls in coastal areas on a scale that would completely protect their areas from flooding in such exceptional weather as caused the serious floods of 1947”* (The ‘Times’, 1951, p7). Flood control works to widen and embank the Thames and its tributaries, designed to cope with a peak flow of 15,000 million gallons a day, were considered *“enormous in size and prohibitive in cost”* and *“each of these plans would mean that the Thames as known the world over would virtually disappear and its place be taken by a waterway completely different in character”* (The Times, 1951, p7). The delineation of a *“flood zone on each side of the river Thames throughout its length”* was the intended policy of the Thames Conservancy Board, as *“the most practical method of combating floods such as those experienced early this year.....the flood zone method would be by far the cheapest and would have the great merit of leaving the river and countryside alone”* (The Times, 1947d, p2).

A Discursive Event – 1950s ‘Act of War’ by Nature

This resistance to wider, large scale engineering works in urban areas broke down after catastrophic flood events involving loss of life in the 1950s. Lynmouth in Devon (South West of England) was flooded in 1952 *“at the height of a storm more violent than anyone could remember”* (The Times, 1953, p8) with the loss of 33 lives. In 1953 floods *‘invaded’* the east coast of England claiming an estimated 307 lives (Steers, 1953). The Labour MP for Lewisham asked (to cheers) in the House of Commons *“were the Government mobilizing all the military forces to get a quick move to plug the gaps that existed on the east coast, in order that further damage be avoided?”* and *“would the Prime Minister assure the House that all the resources of the State including the military would be mobilized?”* Mr Churchill assured

the House of Commons that “*everything in human power*” would be done; “*all the resources of the state will be employed....Other and more permanent measures will have to be taken later and it seems to me it is a matter which falls within the general scope of my assurances that this disaster will be dealt with on national lines*” (The Times, 1953, p11). The Minister of Agriculture stated that this would present one of the greatest civil engineering problems to be faced. MP for Clackmannan and East Stirling “*doubted whether an atomic bomb would have done more damage. The floods should be regarded as an act of war by nature*” (ibid). In the House of Lords Viscount Swinton stated “*once again, as in the ravages of war, we had suffered in common with our allies and friends*”, the Viscount was sure the House would approve the intention of the Government to treat the catastrophe on a national basis, “*we would repair the ravages, reinforce our defences, and we would rebuild the houses and restore the land*” (The Times, 1953, p4).

4.5 Cities in Flood; ‘Where Were the Planners?’

Despite the flood defence discourse to ‘protect’ development on the floodplains, an ‘absence’ of planning or ‘bad’ planning was blamed for flooding in urban areas and again, with recommendations “*that full use should be made of the Town and Country Planning Act to prevent sporadic and ill-considered development*” (The Times, 1954, p6). Built up areas were debated in the media to “*present a large and complex problem which, in all probability can eventually be solved only by removal of houses and businesses situated within them*” (The Times, 1951, p7). The question had been asked “*whether it was wise, for instance, for so many private houses to be crowded upon Canvey Island, a fairly vulnerable marsh*” (ibid). In many other parts of England a “*lack of foresight, or absence of planning, accounts for much of the damage and inconvenience to which minor floods give rise. The same river authority that deals with the Medway and Romney Marsh has also to deal with flooding in such places as Orpington, where the problem, which would be small if the area were still agricultural, has become urgent because the area has rapidly developed into a London dormitory. A still more impressive example of bad planning occurred when the town of West Bridgford sprang up on the outskirts of Nottingham in the nineteenth century, It was built on the natural washlands of the Trent, and in times of flood ever since then the overflowing water has had no other sufficient outlet. This bad planning in the past is now being remedied by the Nottingham flood protection scheme, estimated to cost £560,000, on which work began last year*” (The Times, 1951, p7).

1960s Planning Pressures

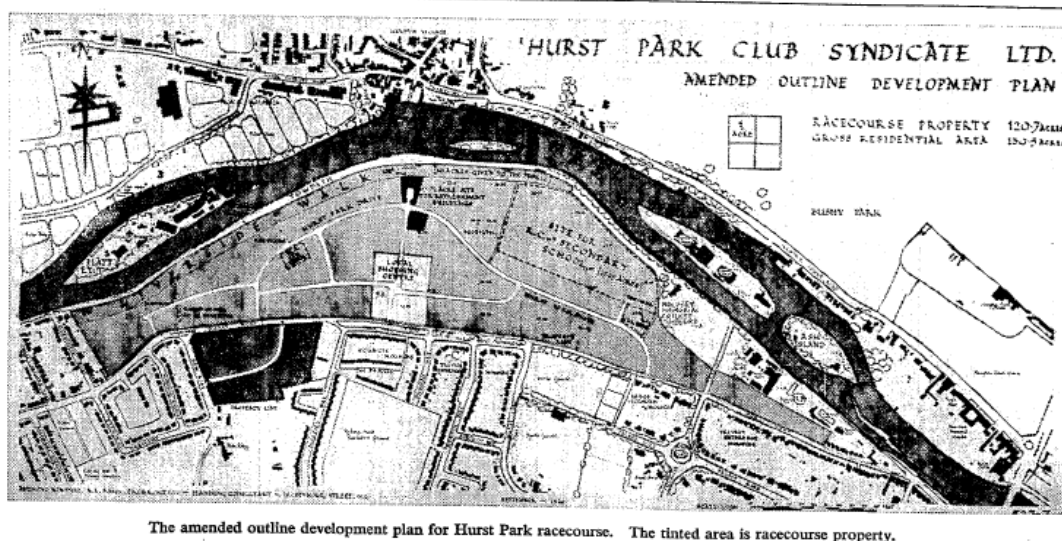
Memories fade quickly. 1961, Dr. Charles Hill, Minister for Housing and Local Government declared Local government reorganization was on the way to provide a more efficient machine to deal with development and land use problems, a population increase in England during the next 20 years of well over four million had to be catered for; *“planners must do more to meet the challenge of a booming population and a bursting economy....planners must not be afraid to experiment”* (The Times, 1961). Stedman (1958), Lecturer in Geography at the University of Birmingham, reported in *“the Townscape of Birmingham”* that the *“only real obstacles to urban extension were the marshy flood-plains of the several streams which traverse the site. Some of the smaller valleys, such as that of the Cole, now form miniature intra-urban ‘green belts’ of parks and recreation grounds because the land is unsuited for other uses. The valleys of the streams that cross the Bournville estate have been deliberately laid out as strips of parkland”* (p226-27). Post 1945 with the acute shortage of building land in the city *“some undoubtedly rather unfavourable sites have been used. The marshy Rea valley between King's Norton and Northfield, for instance, had been avoided with good reason by earlier builders, but the pleasant green belt which it formed has been sacrificed to post-war housing demands* (ibid).

The 1957 Franks report on tribunals and inquiries (Cmnd. 218) had encouraged higher expectations of public involvement and transparency in planning decisions. From the mid-1950s the land-use decision processes gradually become more transparent and open. Societies, such as the Civic Trust, were formed following the 1957 Civic Amenities Act, which went on to play major roles in land use controversies through the 1960s (Gregory, 1971 in Grove-White, 1991). The planning system became used as an arena for public argument, *“in which complex issues of policy could be dramatized in terms of individual developments, in a fashion which the all-important news media could digest”* (Grove-White, 1991, p38). In *“Cities in Flood: The Problems of Urban Growth”*, (‘flood’ in this case relating to congestion and sprawl), Peter Self (1957) observed the *“crisis”* in urban planning in Britain which he saw as *“essentially a loss of spirit, enthusiasm, and the sense of high purpose. Instead, too many planning authorities are coming to look upon themselves as simply umpires among various claimants for land for various purposes”*. He saw one result as a false or insubstantial conflict, of that between the *“passion for space”* of the rapidly increasing urbanites and the *“preservationists”* of the rural countryside.

Planning ‘Umpires’ or ‘Umpired’?

The case of Hurst Park on the River Thames, Surrey, highlighted growing media interest in the planning ‘arena for public argument’. In 1960 a planning proposal was submitted for 120.7 acres of Hurst Park racecourse to be developed as a residential area, as a “*substantial contribution to solving the housing problem*” (The Times, 1960a, p4). Wates Ltd, the developers were satisfied that the result would be “*quite beautiful and not at all what some people seemed to fear*”. Surrey County Council, speaking at the Public Inquiry, were “*resolutely opposed*” to the development, citing it a “*substantial and material departure from the county development plan*” and “*it was contrary to the council’s policy of refusing to allow development on the floodplain of the Thames; and the amenities of this part of the river were worthy of preservation*” (The Times, 1960b, p3). The Thames Conservancy Board also objected to the proposed development of Hurst Park racecourse as a residential area because a “*large part of the course is subject to flooding and restriction of the flood plain of the Thames had a cumulative tendency to increase the levels attained in floods*” (The Times, 1960c). The chief engineer of the board told the inquiry that “*this tendency, if allowed to increase unchecked, could eventually increase the flood levels to a disastrous extent*” (*ibid*). A petition against the development was made to the Ministry with 2,876 names.

Figure 4.1: Development Plan for Hurst Park Racecourse 1960



Source: The Times, 1960

One year later - permission was granted for houses and shops on approximately 54 acres of Hurst Park racecourse by Mr. Brooke, Minister of Housing and Local Government.

The Planning Inspector had considered that the racecourse was “*superfluous to need*” (The Times, 1961a, p5). He did accept that the question of flooding was the most important single factor and that this dictated the apportionment between building land and open space, with raising of the land subject to flooding to a height of six inches above the 1947 peak flood level as an “*adequate safeguard against flooding*”, despite the Thames Conservancy stating that if the applicant’s proposal to bring in filling material to raise the affected areas above flood level, this would have the effect of raising the flood levels immediately above and below Molesey weirs by one and a half inches (The Times, 1960c). Because of the danger of the cumulative effect of losses of flood plain the Inspector thought “*no precedent should be established for further flood land development, unless it could be clearly shown that its function was inseparable from the river or that it had overriding advantages*” (*ibid*). Major Aubrey Buxton, honorary treasurer of the Council for Nature advised a watch on Planning Appeals, he predicted that appeals “*for this and that project*” would ‘flood’ the country during the next decade (The Times, 1961b). There were 7,000 such cases a year at the time, Buxton thought “*thousands might be permitted, and the overall effect would then be the steady reduction of the few remaining unspoilt tracts and areas and a consequent loss of amenity to country lovers.... sometimes it appeared as if the official mind thought it had failed to achieve anything unless it supported a scheme*” (*ibid*).

In March 1961 there was widespread flooding in riverside areas of London. The debate to construct a flood barrier across the Thames ensued. Labour MP for East Ham asked the minister if “*in view of this further warning of the precarious position of these areas he would expedite his consideration of the Thames flood barrier or some equivalent protective construction*” (The Times, 1961, p4). The Minister, Mr Brooke, replying that he was “*trying to hasten a decision on the barrier scheme....the position at the moment is that the Port of London Authority are anxious about the effects of such a scheme on navigation, and several authorities have made other reservations*” (The Times, 1961, p4). A letter to the Times suggested one planning objective should win wide spread support “*save from those who glory in the mud flat, the marsh and the unsalubrious creek.....ensuring that from Greenwich, with its glorious Wren architecture fronting the river, up through the heart of the capital city, the river will be sustained as a generous expanse of water, a visual public asset and a common highway, easy of public access and easy upon the eye....I submit, without faltering from the main objective, the flood defence of Greater London*” (The Times, 1969, p11).

Further Planning Control on Floodplains

Back in Surrey, in 1965 a new policy was framed for control of development in areas liable to flood in the Thames valley sector of Surrey. The two main aims were: to control development which submits occupants to risk of hazards and hardships caused by floods; to prevent development which in their opinion, after consulting the Thames Conservancy, would be likely to impede free flow of water to the Thames in time of flood, or lead to aggravation of flood problems elsewhere. The report also stated the “*ideal would be the complete clearance of the flood plains and washlands*” but the local planning authority accepted that for financial and other reasons this would be impracticable (The Times, 1965, p7). However, the local planning authority would, where an owner wishes to sell a property by agreement, offer to acquire it to make a contribution towards partial clearance of the flood plain and reduction of resident population (*ibid*). Yet, headlining as “*Dealing with the flood threat: where were the planners?*” the Honorary Secretary of the Thames Ditton Island Residents’ Association, in Surrey, commented upon the “*complete absence of any policy or leadership*” for the past 20 years on the occasions of natural disasters in this country (The Times, 1968, p9). “*Indeed, the public authorities have been consciously adding to the problem of flooding by directing increasing loads of surface water into natural waterways without taking the necessary steps to see that these were either capable or were being properly maintained and improved to take the loads being imposed upon them*” (*ibid*). Further north, on a new estate of 200 houses near Warrington, “*on land that Lancashire County Council five years ago declared liable to flooding*” was turned into a lake in 1971 when a brook overflowed after heavy rain. A Lancashire county councillor said: “*Five years ago, on the advice of the Mersey and Weaver River Authority, the county council rejected a planning application for the estate because the area was liable to flooding. The builder appealed to the ministry and won.....All we can do now is to press the river authority to make an early start on a flood relief scheme estimated to cost £36,000*” (The Times, 1971, p2).

In the mid-1960s there was widely shared dissatisfaction with the development plan system, in place since the Town and Country Planning Act 1947, the continuing escalation in levels of dependency on road transport was seen as central to the need for change. The Town and Country Planning Act 1971, saw the creation of the new system of structure and local plans to intensify and streamline economic growth (Grove-White, 1991). Two years on, in an April White Paper ‘Widening the Choice: the Next Steps in Housing’, the Government announced “*new measures designed to provide more land for housing,*

but equally aimed at preserving the environment” (The Times, 1973). A detailed set of guidelines derived from the White Paper were regarded by the Government as an “interim measure before the structure plans [were] completed” (*ibid*). Furthermore, local authorities were told for “*growth areas*”, planning applications “*must be considered against the background of a strong general presumption in favour of housing. In such cases, the presumption should be overridden only if there are exceptional planning objections to development*” (*ibid*). There were a series of highly controversial public inquiries in the mid 1970s, including the M42, M3 and Aire Valley proposals (Levin, 1979 in Grove-White, 1991). Many local planning authorities saw themselves “as bound to assist the implementation of central government attitudes and policies”, merely seeking mitigation of the worst environmental side-effects on amenity or landscape from new developments (*ibid*, p35). National Government level planners also reacted negatively to environmental impact assessment (EIA), statutory systems emerging from the European Commission's interpretation of the EIA provisions from the US National Environmental Policy Act of 1970 (*ibid*).

4.6 A Silent Spring – First Wave of Environmentalism

The modern era of environmental politics in England dates from the 1960s, marked by escalating public concerns in western countries reacting against the impacts of science, technology, industrialisation and undifferentiated economic growth (Adams, 1997; Grove-White, 1991). Books, essays and numerous conferences recording the environmental destructiveness of modern society had actually begun to appear in the middle of the century, attracting just brief attention but with little effect; notable publications including *Deserts on the March* (1935) by Paul B. Sears; *The Road to Survival* (1948) by William Vogt; and *Our Plundered Planet* (1948) by Fairfield Osborn (Keith, 1999). It was *Silent Spring* (1963), by Rachel Carson, which has been widely credited as the catalyst that transformed environmental concern into a social movement, when environmental warnings received serious attention (*ibid*). Nicholson (1970) described the transformation in attitudes in the late 1960s as an “*environmental revolution*” (p21 in Adams, 1997).

In the initial Victorian origins of the ‘environmental movement’, the late nineteenth century, the reaction to the pace and change of industrialisation and modernity had

found an outlet in a concern for ‘nature’ and the loss of the countryside (Adams, 1997). The nature conservation movement continued to grow through the twentieth century. Friends of the Earth UK was established in London in late 1969, thought to be the “most dynamic of a new wave of environmental groups” and a catalyst for the reinvigoration and refocusing of some of the established groups, for example the Council for the Protection of Rural England (CPRE) and the Royal Society for the Protection of Birds (RSPB) (Grove-White, 1991). The first White Paper on the environment was published in 1970 (Cmnd. 4373), and later in the same year, the Department of the Environment was established (Cmnd. 4506). Climate change was already on the agenda, with Lamb (1967) in the *Geographical Journal* stating that the possible effects of the activities of Man must be considered in increasing the amount of carbon dioxide and other pollutants in the atmosphere; “*research directed at understanding how climate changes come about must continue, and could usefully be stepped up both in the interests of modern long-term economic planning and because we live in an evident time of change*” (p 466).

Ralf Gardiner (1963) noted the widespread concern over the rapidly changing countryside; “*the cultivated landscapes, created out of the wild forests and swamps by generations of landlords and farmers, are now under pressure from an urbanized society with rising standards of living... Economic expediency, it is pointed out, has been allowed automatic range, undisciplined by any strategy aiming at harmony between human beings and their environment*” (p9). He noted in particular, water as the vital element in landscape and the great problem in Britain being the concentration of population and industry within far less spacious areas, yet governmental urgency, “*especially at the lower levels, is hardly vehement enough....Planning authorities submit too easily to the winds of change*” (*ibid*). Gardiner reported from a number of conferences and working parties that on the Continent landscape architects had proved the benefits of river bank planting and the possibility of combining natural scenery with flood and flow control. Recent work on the Danube and the Moselee had shown that great rivers could be contained by vegetation means, and that to “*embank them with barren concrete is a barbarism that defeats its own end*” (*ibid*). Gardiner believed the teaching of ecological principles might reverse the present trend towards environmental contamination, and poisoning of soil, air and water; and engender a responsibility for landscape husbandry formerly exercised by landowners, farmers and foresters and no longer within their sole effective power (*ibid*).

The Political Ascent of the 'Environmental Problematique'

Hajer (1997) cites the early 1970s as the beginning of the ascent of 'the environmental problematique' up the political hierarchy, and when most Western countries created the environment as a (semi) independent field of attention for the first time. In 1972 the report to the Club of Rome "Limits to Growth" was delivered and "Blueprint for Survival" published in the Ecologist, the UN conference of the Environment was held in Stockholm, Sweden, the largest UN conference to date (Hajer, 1997). According to Hajer (1997), together they created a widespread credibility for the claim that the environmental crisis was serious and needed to be addressed. The Ramsar Convention came into force in December 1975, in recognition that certain classes of wetlands could be globally significant for migratory fish and bird populations (Turner, 1991). Seven ratified countries signed up to halt the decline of wetland habitats globally, to maintain their ecological functions and wildlife through national planning, the creation of wardened nature reserves and through the facilitation of wetland-based research (*ibid*).

Ecologists – An Immensely Potent Force Being Lost

In the media, the Times newspaper, a report was quoted that confirmed what "*one glance could tell, that some Northern rivers are grossly polluted.....However unnecessarily doom-laden the Blueprint for Survival may have seemed to some academics, there is a large and responsible lobby which will be reassured to see the suggested 'coalition of organizations concerned with environmental issues' turned into a reality*" (The Times, 1972, p3). Dr. David Shimwell, lecturer in ecology and conservation at Manchester University appealed to academics in 1972, to actively defend the environment, stating "*many people associated conservation with the Nature Conservancy, the Council for Nature, the Naturalists' Trust and similar bodies. Most of them have been reticent on major conservation issues. Militancy has generally come from the Ramblers' Association and Council for the Protection of Rural England, who have highly commendable intentions but present a popular image of the conservationist as a muddy-booted, well-intentioned but dismally inadequate individual...While the theory of conservation lay close to the heart of most ecologists, they showed little initiative to approach the issues through experience. An immensely potent force was being lost*" (*ibid*).

Planning Consultant, Bessey (1970), has already stated that "*the current explosive and unprecedented release of human purpose and energy on behalf of an endangered environment must be apparent to all observers of the national and world scene. An accelerating outpouring of ideas,*

information, talk, and literature represents a great and active, but amorphous, counterforce to the mounting and worldwide environmental pollution and degradation that has reached crisis proportions in recent decades and finally engaged wide and deep public awareness and concern” (Bessey, 1970, p563). However, in an early recognition of the need for partnership and integration, Bessey continued *“that human nature and behavioural elements raise doubt as to its continuation at high peak and its ultimate triumph. Will it be sustained, or will diffusion, delayed actions, conflicting or diverging views within the movement, and other frustrations bring about a sense of futility and apathy or resignation? The fundamental crisis will remain and the effort must persist. Yet let down-perhaps to a disastrous degree-will come in the absence of unifying and supporting forces of common need and purpose, direction, organization, and cooperation”* (ibid).

4.7 New Heights for Flood Defence and Depths for Land Drainage

At the same time as the rise in environmental awareness, engineering schemes were also rising to their greatest height, in terms of expense as well as extent. Barrage and reservoir schemes also featured in the engineering debate. *“Economic planning councils in East Anglia and the East Midlands, the National Farmers’ Union, the Country Landowners’ Association and the Water Resources Board were also in debate with the Government over a Wash Barrage at an estimated cost of £287m (with consultant’s feasibility study estimated at £1.5m) with the main purpose of “water storage in a thirsty future”* (The Times, 1967, p12). Some cities were withdrawing so much water that rivers downstream from the withdrawal dried up and the response was to tap water resources from increasingly larger distances (Novotny *et al.*, 2010). Rivers were also further impounded for the acquisition of new water resources for the continuing rise in population, including the one of the earliest schemes to be constructed, the River Dee (1950-79). Discharges were regulated from impoundments in the uplands of North Wales, flood control also implemented along the middle course of the river, which subsequently caused major damage to agriculture and housing development (Eaton, 1989).

Enter the ‘Unattached Stranger at the Party’ – the Hydrologist

In 1969 Times author Roy Hay stated *“last autumn showed vividly that we are liable to damaging floods as soon as the autumn rainfall becomes excessive. When this happens, it is our habit to complain loudly, but having concentrated on rapid run off and having covered some of the natural*

floodplains of our rivers with buildings, we should not be surprised if water invades ill-placed houses. Our second national habit is to forget about it once the mess has been cleared up” (The Times, 1969, p9). Hay stated that to tread the narrow path between excess and scarcity required foresight and skill, and that we needed the techniques of the hydrological scientist working with engineers and technologists. *“The hydrologist in Britain has always been like the unattached stranger at the party: everyone was pleased to meet him, but nobody seemed to know where he lived or worked”* (ibid). Hay congratulated the NFU on engaging a firm of Dutch consultants to advise on water conservation and supply. He believed that as our own resources were so limited, it was not surprising that the N.F.U. had turned to the Netherlands for guidance; *“there is more truth than boastfulness in the saying ‘God made the world, but the Dutch made Holland’. It was they who first taught us to drain the fens and the reason for their skills is obvious: their problem of too much water and too little land was an urgent one”*. He believed that a scientific approach to the rational use of water resources made in good time could save the country immense sums of money, that we should *“recognize the need for specialized scientific skill in water problems, to start training a few more hydrologists, and to ensure that they form the cadre of a profession which will become more and more essential to our national well-being”* (ibid). In September 1968 it was announced that an investigation into the prevention and forecasting of floods was to start at the recently formed Institute of Hydrology, (financed by NERC). The first part of the study would cost £200,000, involve a team of 15 scientists and would provide within four years ‘concrete’ proposals for action by civil engineers and local authorities in planning drainage schemes. The first task was to establish essential background information about the frequency of flooding in each area of the country (The Times, 1968).

Laying the Discursive Foundations for the Thames Barrier

Into the 70s, and at the beginning of the decade the Government bore *“65 per cent and the GLC 35 per cent of the £5.5m cost of raising the London riverside walls by 18in. pending construction of the Thames flood barrier at Silvertown at the end of the decade”* because of the *“seriousness to London of another unpredictable North Sea surge like that of 1953”* (The Times, 1971, p2). In Parliament the need for a Thames barrier was said to be beyond doubt; *“forty-five square miles of London were at risk in the sense that they were below the highest recorded water level. Within that area lived 8000,000 people in 250,000 dwellings and by day a million people were affected.....Even the Palace of Westminster would be in the firing line. A large part of the artistic and cultural heritage would literally go down the drain if the Bill was not passed. A flood in London*

would be infinitely worse than the flooding of Venice in terms of the amount of money involved and the human suffering. A figure of £1,000m loss had been suggested but it was probably an underestimate.....At the moment there was a one in thirty chance of a serious flood in the middle of London, which like Venice was sinking. The proposed barrier would reduce the risk of flooding in central London to one in a thousand in the year 2030” (The Times, 1972, p10). Mr Wellbeloved (Efith and Crayford, Lab) said “one of his complaints was that London’s dream town of Thamesmead was being built on Erith marshes, land known to be subject to flood risk. But it was essential that the barrier should be built because of the danger to London” (ibid).

An example of the change in discourse and policy at the Thames Conservancy, originally reluctant to undertake engineering works and previous champions of flood zoning, can be seen in 1971 when a £2m scheme was presented, again in Surrey (site of Hurst Park Racecourse, section 4.5). The scheme, to protect 10,000 homes and prevent a “*repeat disaster of the 1968 river Mole flood disaster*” was outlined by the Conservancy, to widen, deepen and straighten the channels, build new sluices and eight new bridges. The exhibition organised by the Conservancy, at East Molesey, showed the £1.5m damage from 1968 when 1,500 acres of land and 10,000 houses were flooded after a storm. Experts now believed “*the scheme will give 800-1 protection against future flooding in the lower river Mole area*” (The Times, 1971, p3).

The ‘Environmental Problematique’ vs the 1973 Water Act

Developments in wider water management had hitherto been independent to early flood defences, i.e. land drainage. Rapid industrial and urban development in Britain resulted in the second highest population density in Europe and the need for national river basin management (Fish, 1970, p761). Sewers and the introduction of clean, piped water supplies were major engineering works introduced as public health improvements in response to the overcrowded and insanitary conditions of the cities (Eaton, 1989). Now in the South-East of England, water availability was seen as a critical factor if development plans were to be carried through. It was becoming clear that, in addition to the need for co-ordinated management of water use, there was also “*a pressing need for collaboration between urban planners and water managers*” (Rees, 1973, p28). Plans for urban renewal, housing of overspill population and the construction of new towns were seen to influence the timing, location and scale of investment in water resources, and also regional plans for industrial and urban growth were viewed to be co-ordinated with

plans for increasing water and sewage facilities. The Government realised that the present system was unlikely to cope with future demands for water supply and pollution control and announced that the industry was to be reorganised completely (Rees, 1973). The twenty nine River Authorities were replaced by ten Water Authorities under the Water Act 1973 with complete executive responsibility for all water provisions in their areas. These matters fell under the remit of the newly created 'superministry', the Department of the Environment (DOE), which encompassed the MHLG's (including planning) functions (Scrase, 2005).

However, it is believed that the Ministry of Agriculture Fisheries and Food (MAFF) used pressure groups successfully to achieve its goals of thwarting radical policy change in the land drainage policy sector (Richardson et al., 1978 in Scrase, 2005). A separate decision-making structure within the River Authorities, independent and remaining under MAFF control, was won by agricultural and land drainage interests; this merely re-created the decision-making autonomy of the original Catchment Boards in the form of 'Land Drainage Committees' (Scrase, 2005). Land drainage and flood control not being integrated with water supply, was seen to result in "*a loss of the advantages from linking the operation of flood control and supply reservoirs*" (Rees, 1973, p29), notwithstanding the issues of urban development. The increased concerns for the environment in the 1960s and 70s had not filtered through into land drainage and flood control under the leadership of MAFF. The 1973 Water Act did include what Scrase and Sheate (2005) retrospectively termed 'the lame injunction' that Water Authorities should have regard to the desirability of preserving natural beauty, flora and fauna. However, land drainage continued at an unprecedented rate through the mid-1970s at approximately 100,000 ha per year (Cole, 1976 in Scrase and Sheate, 2005). In 1975 the government white paper 'Food from our Own Resources' (MAFF et al, 1975) confirmed their priority, with MAFF's chief engineer reiterating that "*land drainage is the first function of a river*" (Cole, 1976 in Scrase and Sheate, 2005). 'Section 24 surveys' were introduced from the Water Act to enable plans to be made "*in a completely rational way*" for proper drainage "*from field to sea*" (*ibid*).

Early Benefit-Cost Ratios

In urban areas design solutions were chosen for "a human lifetime standard of protection", that is 50 to 100 years (MAFF, 1974 in Scrase, 2005). Whilst placing a

monetary value on human life and suffering was cautioned against as ‘distasteful’, the ‘intangibles’ or ‘immeasurables’ were to be noted, and could be used should the benefit-cost ratio fail to reach unity with the standard rate (Scrase, 2005). Scrase (2005) highlights that the 1974 CBA guidance states that, *“in view of the imprecision of the data and the assumptions that have necessarily been made the engineer should carefully judge, at each stage, the upper limit of the various benefits, so that his final figure represents the maximum permissible after allowing for uncertainties”* (MAFF, 1974, p5). Scrase (2005) believes that MAFF clearly wanted schemes to be built and the quotation underscores the general ethos behind the guidance, that project developers were encouraged to decide upon a design and following that, seek to demonstrate that its economic benefits outweighed the costs.

4.8 Knowledge of Urban Physical and Human Geography

The impacts of urban growth on river systems were becoming well documented and understood in British academic circles in the late 60s and 70s (Coates, 1974; Leopold, 1968; Jens and McPherson, 1964; Savini and Kammerer, 1961; Schaake, 1972; Schmid, 1974; Speiker, 1969; Walling and Gregory, 1970; Wolman, 1967; 1973 in Douglas, 1976). The soon to be influential geographer, Ted Hollis, began his doctorate in 1968 investigating the urban hydrology in Harlow, at University College London, publishing through the 70s on the effects of ‘man’s impact on the hydrological cycle’, including the effects of urbanization on floods (Hollis 1974; 1975; 1979 in Munton, 1997). Ted Hollis was one of the participants in a symposium held in 1975; the records display the depth of understanding of the physical problems of the urban environment possessed by academics in geography and water management at that time (including other future influential actors in the field - Peter Wolf, M Collins, Edmund Penning-Roswell, R.U. Cooke, B. Brown and Ian Douglas). As Brown (1976) stated *“physical geographers are more likely to be found in rural rather than in urban surroundings but some in recent years may have been observed in towns and cities driving mobile weather stations in the small hours of the morning, following builders’ bulldozers in order to measure sediment yield or setting up stream gauges at the outlets of paddling pools in parks”* (p75).

Douglas (1976) described urban hydrology and land use change in great detail from the establishment of every new building, road or garden. He argued that collectively such incremental changes could alter the stability of river channels, the heights or frequency

of floods and the volume of base flow in rivers, “*water which is of immense value in one area can become an extreme nuisance in another. Indeed, the crux of the urban water management problem is that benefits gained upstream may lead to costs downstream..... Consequently the planning decisions and construction activities of one authority or agency may produce hazards and even losses for another authority or agency*” (Douglas, 1976, p65). In some cases, in the construction of flood mitigation works “*there may be a reduction of the hazard in the protected locality but an increase in the hazard further downstream*” (*ibid*). The understanding of urban hydrology was so far developed as to distinguish particular types of impact associated with the different phases of urban development, from peak sediment production during the construction phase “*when the ground cover is least and the soil most disturbed*”, to the highest flood peaks and shortest lag times between precipitation and flood peak probably occurring “*when the paved surface and building density are greatest and stormwater drainage is most fully developed*”. Also in phases of urbanisation from rural-urban fringe, to the establishment of paved streets with continuous housing, commercial and industrial development, and the urban renewal process when land use is intensified, “*as when an old house standing in a well-vegetated garden is pulled down to be replaced by blocks of flats or offices surrounded by car parks and roadways. Each phase of the urbanization process thus introduces its own set of hydrologic impacts and consequent water management problems*” (p66).

Early ‘Blue Belts’ - Riverine Green Belts

In an echo of the Oxford green/blue belt four decades earlier (section 4.3), Douglas quoted experience from New South Wales. In Armidale, on the Macleay River; “*often nothing more than a series of pools linked by a slight trickle of water. Yet in flood the Creek is over two metres deep and spreads across a wide flood-plain in the city centre. A proposal to reduce the effect of such floods by putting the Creek in a straight, concrete-lined channel through the city led to widespread public reaction from a whole series of pressure groups. Property developers saw the opportunity to use newly protected land close to the city centre, but sporting clubs saw the loss of potential playing fields easily accessible from all parts of the city, while the Armidale Beautification and Improvement Committee was anxious not to lose the green belt with exotic willows which runs through the city. Public pressure eventually led to the abandonment of the rectification proposal, the acquisition of flood-plain land as public open space and playing fields, and to the creation of a riverine green belt through the city which approaches the planner's ideal of vegetated open space along urban streams. The Armidale green belt has undoubted aesthetic and recreational appeal, but it is also a valid form of hydrologic planning in that the flood-plain storage capacity for stormwater discharge is retained while providing the town with a*

potentially attractive waterway” (ibid, p68). Douglas concluded that awareness of the flood hazard and better land-use planning could result from accurate flood hazard mapping which would help to (amongst other objectives) prevent improper land development in flood-plain areas, protect prospective home-buyers from locating in flood-prone areas and “*guide the purchase of public open space*”. He noted that flood hazard maps were widely used for flood-plain zoning, but that such zoning is “*not always welcomed or accepted by flood-plain occupiers.....the quantitative measures of geographer-hydrologists and their colleagues in other disciplines are not sufficient on their own to achieve the adoption of sound management programmes for the urban environment. People differ in their perceptions of hazards and their valuations of amenities. Understanding of the diffusion of environmental awareness, of people's attitudes to their property and homes in hazard zones, and of the pressures which lead people to build or rebuild in risky locations is essential if the growing technical knowledge is to be successfully applied*” (p71).

The Need for Geographers with an Adjective other than ‘Physical’

The engineer Peter Wolf desired greater numeracy in the debate and believed that “*our great weakness is that in this country there are half-a-dozen places like Lynmouth with great danger potential. We must try to understand hydrological cause and effect and pay more attention to the numerical results which may reveal extreme dangers. There are a hundred ways by which we should extrapolate with confidence from known numbers and these of course include sediment flow, mud flow and geological as well as water quantity and quality numbers*” (ibid, p75). Dr Edmund Penning-Rowell of Middlesex Polytechnic also raised the point of data collection by geographers in helping to fill gaps in the existing information system, as in the flooding analysis context a substantial change had been brought about by Section 24 of the 1973 Water Act. “*This very important section requires Water Authorities to delineate flood hazard areas and calculate flood damages. To date little has been achieved owing to lack of resources and expertise in Water Authorities. This is an area where research by complete geographers with their skills of multi-disciplinary analysis, could make a positive contribution to solving some real problems of future environmental management*” (ibid, p77).

Yet, Miss Mary Francis (of Hertford College, Oxford) queried this emphasis on the physical aspects of cities and their feed-back into the physical system over the human aspects of cities and the geomorphological impact of life-styles and socio-economic variables; “*is it not necessary, therefore, for the human and physical aspects of cities to be seen together?*” (ibid, p78). This was considered one of the most exciting aspects of the

problems that had been discussed by Professor Ian Douglas, as “adequate analysis of these problems requires teams of people with different interests, but a certain degree of common language....it is also where I hope I can work with the geographers who put other adjectives than 'physical' in front of their name” (*ibid*, p80). He noted that if the analyses were to be put to use, then it must also be understood why people lived in the hazard zone, how they responded to hazards, and how the whole human and physical system worked; “it seems to me, after four years away, that British geographers are still hidden away in their adjectival boxes and are seldom developing team approaches to these applied problems. Our attempts at such teamwork in Australia have been most exciting” (*ibid*, p80).

The question of increasing awareness throughout the educated population was seen as vital importance in terms of the prevention of dangers or mitigation of dangers. Mr Collins of University College, London pointed out that the views of the natural sciences are often sought when planning authorities are taking decisions about the location and form of urban development or redevelopment. He quoted the example of Thamesmead in south-east London, where all the scientific advice that they had assembled “suggested that this was the last place in London to have located a new 'township'..... The decision was taken for political reasons and had scant regard to any technological arguments” (*ibid*, p76). He detailed how in the late 1950s the London County Council Development Plan had accurately zoned an area which was liable to subsidence due to a number of old caves underneath; “those persons whose dwellings were situated within this zone objected strongly on the grounds that they could not sell their houses. The zoning was deleted at the first review of the Plan” (*ibid*). His point was that there was a “need to look more closely at the social and economic consequences of intervention, as well as the level of predictability of the outcome, before proceeding further” (*ibid*).

Ian Douglas (1976) also noted that one of the major factors in flood problems in Britain was a rural problem, “that of the efficient field drainage systems and the rapid runoff which stems from them” (*ibid*, p80). He knew that whilst individual impacts could be identified with relative ease, the behaviour of a river was the net response to the whole series of events in a catchment area, and that these events were the responsibility of a complex set of interacting agencies and interest groups. Technical data could be provided on the likely hydrologic outcomes of specific types of urban land developments, “however, to decide on the best type of water management for a given urban area requires an evaluation, not only of the

technical data, but also of the aspirations and perceptions of the wide variety of private, local and national interests involved' (*ibid*).

4.9 Rolling Back 'Local Authority Restraints' on Development

The Conservatives, under Margaret Thatcher, came to power in 1979. Thatcher had an unequivocal political programme for the economic restructuring of Britain according to neo-liberal prescriptions (Hajer, 1997). Her 'rolling back the state' and improvement of the general climate for business, Hajer (1997) believed, certainly did not leave space for an active environmental policy and nor did reforms to the planning system leave room to heed the messages from urban geographers and hydrologists.

Local authority planners, along with other public sector professionals, felt the full force of the new Conservative Government's ambition "to reduce bureaucratic obstacles to the freer working of markets" in the early 1980s (Grove-White, 1991, p36). Less than a decade after the major restructuring of the Town and Country Planning Act 1971, the Local Government, Planning and Land Act 1980 continued to strengthen district councils at the expense of the strategic level county councils, "whilst in reality moving strategic power and control upwards to central government" (*ibid*, p37). The response to the erosion of local authority planning controls in planning law and policy, since 1979, was "ever-more determined and conspicuous political lobbying aimed at breaching local policies of planning restraint" by interest groups such as the House Builders' Federation and Consortium Developments Ltd. (Grove-White, 1991, p41). (The chair of the latter group being, Tom Baron, previous specialist adviser on housing policy to Michael Heseltine (*ibid*)). Michael Heseltine, Secretary of State, in a series of speeches aimed at discouraging alleged "*local authority restraints on needed developments*", made the Government's intention clear to "*radically recalibrate and refocus the planning system to encourage the freer and more creative play of market forces*" (DoE Press Notices 576, 1979 and 39, 1980) (Grove-White, 1991, p35). In his pioneering role to regenerate Liverpool in the wake of the 1981 Toxteth riots, he introduced urban development corporations, (also notably in the London Docklands), in a major move to by-pass local authority '*obstructionism*', subsequently followed by enterprise zones and simplified planning zones (*ibid*). A series of DoE circulars on development control aimed at narrowing the basis on which planning permissions might be refused and encouraged a more relaxed local

authority attitude towards new housing and industrial development (*ibid*). This triggered considerable tensions, particularly as the DoE increased its tendency to planning by appeal through the 1980s, particularly the Tory heartlands of the south-east where land use pressure was high (*ibid*). Local environmental issues generated increasing amounts of resentment and controversy, the numbers and rate of planning appeals upheld by the Secretary of State against local authority decisions rose from 8,000 and 29 per cent respectively in 1980, to 13,000 and 40 per cent in 1987 (Grove-White, 1991). The Thatcher Government received a record number of motions at the forthcoming party conference that were critical of the Environment Secretary Nicholas Ridley's handling of planning issues in Conservative rural and suburban England (*ibid*). The safeguarding of the green belt had gained a symbolic significance, safeguarding of agricultural land from development was a key environmental issue (*ibid*).

Further Encroachment onto the Floodplains

By 1983 the survey of Water Authorities by the National Water Council and the Meteorological Office (1983) indicated that approximately a quarter of a million people, or 0.6 per cent of the population, were at risk from a 1 in a 100 fluvial flood, excluding inadequate storm water drainage (*ibid*). The scale of Britain's flood hazard was seen by Penning-Rowsell and Handmer as significant "*despite 50 years' work by water agencies to improve river management with the construction of flood alleviation works*" (p210). Inadequate local government land use planning controls in hazard-prone areas were seen as one of the factors behind the increase in vulnerability; "*no attempt at long-term flood hazard reduction can succeed without policies to control encroachment of vulnerable urban development into areas liable to flooding*" (Penning Rowsell and Handmer, 1988, p213). Penning Rowsell and Handmer (1988) noted the areas affected by the widespread 1947 floods in Britain had since been urbanised, other examples included development of the floodplain at Nottingham, much of the lower Thames floodplain had become urbanised, particularly at Maidenhead and between Windsor and London; "*Thames Water almost invariably opposes such development, but to no avail*" (p213). They documented that fresh attempts were being made to prevent this type of hazard growth, although the government had a "*general antipathy towards tighter land-use planning controls*" (p213).

Nevertheless, the government considered the problem to be "*sufficiently serious to issue yet another policy Circular (No. 17/82)*". This followed those released in 1947, 1962 and 1969

(Department of the Environment et al., 1982). The Circular, similar to those issued previously, sought to encourage closer liaison between the Water Authorities and the local District Councils making land-use planning decisions, *before* the decisions were made to prevent the permission of “*unwise development*” in floodplain areas (*ibid*, p213). However, the problems continued as the Water Authority role was only advisory and their influence on land-use decisions consequently minimal; “*not surprisingly many of their engineers are continually frustrated at seeing floodplain development occurring with planning permission which subsequently requires flood alleviation works, thus effectively subsidizing the developer and preventing coherent flood hazard management*” (*ibid*, p213). Penning Rowsell and Handmer (1988) cited an experienced Water Authority planning liaison officer, who felt that the Circular's arrangements were too weak and that “*co-operation would be improved through additional formal agreements between the relevant authorities*” (Burch, 1987, p. 93 in Penning and Rowsell, 1988, p215). However central government preferred the “*British tradition of persuasion rather than mandatory guidelines*”, believing that a permissive and informal approach was more satisfactory; “*the resulting “temptation for local authorities to seek employment-generating development on cheap floodplain land irrespective of future flooding problems is acute”*” (*ibid*, p215). The Water Authorities also lacked the personnel to respond adequately with appropriate advice to planning authorities within the statutory 28-day time limit; “*it is unfortunately therefore likely that unwise floodplain development will continue, thus perpetuating the tendency for flood problems to grow in the medium to long term and therefore for structural mitigation schemes to be continually necessary to alleviate the inherited hazard*” (*ibid*, p215).

The Thames Barrier

Therefore structural engineering works, subsidised by central government, continued to be the main British flood mitigation strategy in the 1980s (Penning Rowsell and Handmer, 1988). 1982 saw “*what must be the most expensive engineering structure specifically designed for coastal defence to be built in the UK*”, that is the Thames Barrier at Woolwich at the cost of £446m (Gilbert and Homer, 1984 in Orford, 1986, p374). The barrier was designed to save Central and Inner London from the flood-related consequences of a severe North Sea storm-generated surge moving up the Thames estuary (*ibid*). The authors (Gilbert and Homer) represented the Greater London Council (GLC) and the Department of the Environment (DOE), and as were said to have “*partially opened the lid on the long history of planning and counter-planning caused by the vacillation of what may be termed the major villain of the affair! The Port of London Authority (PLA)*”, a “*perspective on how a 'tail*

wagged the dog” delaying the construction of what was seen to possess an obvious value to the cost-benefit analysis, by thirty years after the “*near-disaster*” of 1953 (Orford, 1986, p374). The book looked back to historical times, detailing how riverside development in London had accentuated the possibility of flooding, “*the increasing rapidity of higher and higher flood levels being reached is shown to be the principal spur for the barrier to be built*” through sea-level rise, subsidence of S.E. England, increasing settlement of the London area due to groundwater abstraction, amplification of estuary tidal range plus the overriding problem of North Sea surges (*ibid*). The 1953 storm-generated surge “*triggered the realization that London, Central Government and (most importantly for Britain attempting to rebuild a post-war economy) business could be dislocated if not shattered, by the re-occurrence of such an event*” (*ibid*, p374-375). In reflecting on lessons learnt from the project, “*an important suggestion is that a single authority should be considered to be empowered for any future massive construction projects in order to speed up the development process*” (*ibid*, p375). The suggestion was made that “*the power of the statutory UK public inquiry system into the position and design of such structures needs to be drastically curtailed!*” (*ibid*, p375).

The internationally renowned civil engineering structure, the Thames Barrier, was seen to give “*wider national publicity and political visibility to flood alleviation than at any time since the disastrous East Coast floods in 1953*” (Penning-Rowsell and Handmer, 1988). Despite criticism growing overseas in the USA literature that overtopping of major structural defences could exacerbate potential flood damage, such criticism was not evident in Government circles in England, support was on a high.

4.10 Summary: The Shifting Strands of the Flood Defence Discourse

Chapter 4 has reconstructed the genesis and solidification of the hegemonic discourse; flood defence. A comparison of the cuts taken through the flood defence discourse strand, at various points until the 1980s has enabled further insight into its institutionalisation, through the effects on the other three dimensions of the policy arrangement: actors, rules and power. Research question 1 of the thesis has been addressed: How and why did the discourse on flood defence become hegemonic in the policy arrangement?

‘Drains and Ditches’

From its conception until the 1950s, the flood defence discourse has been intimately entwined with agricultural interests and the practice of land drainage, although the ideology to control and dominate ‘urban’ rivers has also been evident from as early as the 18th century, as with rural interests, in the pursuit of growth and in the accumulation of capital. Initial small scale and uncoordinated efforts to drain land and control polluted, troublesome rivers saw a rapid expansion with the onset of ‘modernity’; the “grandeur of the schemes for embanking attested to the magnitude of this representational threat presented by an unruly, inappropriately civilized natural at the very centre of the cultured city” (Oliver, 2000, p230). The early ‘rules of the game’ in the form of the Land Drainage Act of 1861, had to be supplemented by the power of *‘length of purse’* to overcome the resistance of *‘backward peasants’*, yet World War II exposed the vulnerability of reliance on foreign imports leading to what Scrase and Sheate (2005) now describe as a ‘pivotal point’ in new institutional arrangements – the Land Drainage Act 1930.

The Land Drainage Act, with the creation of 46 Catchment Boards, gave engineers within the boards, together with those in Internal Drainage Boards and Local Authorities, the permissive powers and financial resources to carry out flood defence engineering works to eliminate *‘vast unhealthy washes’* and *‘swamps’*. As Scrase (2005) states, for policy purposes, rivers were presented as the top of a hierarchy of drains that went down to field scale ditches. Large rivers, otherwise termed ‘arterial drains’, were *‘improved’* through widening, deepening and straightening. On lowland rivers tree clearance and the removal of other vegetation was undertaken in the interest of creating and maintaining *‘drains’* in a *‘proper state of efficiency’* (Scrase, 2005; Werrity, 2006). The central questions were technical ones; how to solve drainage ‘problems’ so that the Ministry of Agriculture (later Ministry for Agriculture, Fisheries and Food (MAFF)) could modernise and expand food production ((Bowers 1998; Penning-Rowsell and Handmer, 1988; Scrase, 2005). The system was overseen by the Ministry, with grant aid for new capital works, which together with subsidies from the Common Agricultural Policy, field drainage continued apace “making the general taxpayer the major contributor to upgrading every part of the drainage system from fields to the coastline” (Scrase, 2005, p121).

Discursive Events

This chapter has covered a time span in which several major flood events took place, in 1947 on the Fens, 1952 in Lynmouth and the dramatic East Coast storm of 1953. The first flooding event consolidated the need to protect agricultural land, despite the co-devastation in urban areas. Mr. Williams, Minister of Agriculture - *“these inundations...can only be described as a disaster of the first magnitude which cannot fail to have the most serious effect on our home food production this year”*. The subsequent flooding episodes can be termed ‘discursive events’, as they, particularly the great storm, appeared on the discourse planes of politics and the media for a prolonged period of time and influenced the future trajectory of the flood policy discourse (Jager and Maier, 2009). Power constellations were at work, both the media and government actors employing discursive strategies to make their proposals acceptable – *‘full-scale military operation’*; *‘troops engaged in Operation Flood’*; *‘The floods should be regarded as an act of war by nature’*; *‘repair the ravages, reinforce our defences, and we would rebuild the houses and restore the land’* (section 4.4). These specific historic references to the war utilised ‘pathos’ that aimed to “play on the emotion of listeners” (Hajer, 1997, p38).

Another task for the discourse analyst, according to Hajer (1997), is to see if existing actors have changed discourse position, or have new actors influenced the new policy direction. In this case it was the former. The Minister of Agriculture was present in the House of Commons in 1953 employing discursive strategies as detailed above. The Thames Conservancy in 1951, considered flood control works on the Thames *“enormous in size and prohibitive in cost”* and *“each of these plans would mean that the Thames as known the world over would virtually disappear and its place be taken by a waterway completely different in character”*. Their initial choice of policy was the delineation of a *“flood zone on each side of the river Thames throughout its length”* as *“the most practical method of combating floods such as those experienced early this year.....the flood zone method would be by far the cheapest and would have the great merit of leaving the river and countryside alone”* (section 4.4). Yet following the ‘shock’ flood events of the 50s, the UK Government followed the US lead with a major strategy favouring structural flood defence solutions; dikes, dams, flood control reservoirs, diversions and floodways. By the 1970s, the Thames Conservancy publicly exhibited an expensive £2m scheme to protect 10,000 homes and prevent repeat flood disasters (section 4.6). As land in cities became highly valuable for development, then development further encroached on to floodplains and consequently to minimise the

ensuing flood risk, streams and rivers were straightened, diked, and lined in order to increase their velocity and capacity to carry more flow away from the vulnerable floodplains (Novotny, 2010). In almost every large city, many rivers and streams were culverted and buried to make way for development and land owning interests (*ibid*, p22). Adams, Perrow and Carpenter (2004) described the ensuing hegemonic discourse of flood defence in the UK as invoking “the protection of society and its capital and infrastructure against the incursions of wild nature” (p1932).

The discourse analysis has added nuance and depth to the contemporary literature on flood risk management, which as can be seen in the summary above, comprehensively documents the demise of the fluvial system and associated floodplains through the practice of flood defence. Yet, two surprising findings have bubbled up from beneath the surface of present day rational analyses; early contesting voices to the flood defence discourse, including the oft maligned planner.

Early Contesting Voices

It is commonly perceived that contesting and competing voices to the hegemonic discourse are a feature of recent decades, mainly attributed to the 1990s and associated with the shifts in governance thesis. A careful analysis of archival data has revealed different perceptions of the flood risk problem have *consistently* been present, including strong advocates of floodplain protection and restoration.

Objections to wide spread ‘drainage works’ and engineering ideologies can be seen as early as the mid 19th century with the English sanitary reformer Edwin Chadwick, seeing mid-century British civil engineers as part of the problems, not the solutions; “*both loyal to a primitive laissez-faire and in cahoots with the most corrupt and irrational institutions of local governments*”. Their works termed hyper expensive, uninformed by science, even dangerous according to Chadwick, and worse, they clung to obsolete doctrines and rejected truths from outsiders (section 4.2). With the very commencement of the Land Drainage Act in 1930, the Council for the Protection of Rural England and Sir Patrick Abercrombie, architect and planner, immediately reacted, thinking it obvious that “*the works of enlarging and straightening the river.....will merely result in increased volumes of water being brought more rapidly into the non-tidal river*”. In the 1960s “*environmental revolution*”, ecologist Ralf Gardiner (1963) noted water as the vital element in landscape, quoting work on the

continent with the Danube and Moselle that have shown great rivers could be contained by vegetation means. Gardiner stressed that to embank rivers “*with barren concrete is a barbarism that defeats its own end*” (section 4.5). Geographers in the late 60s and 70s also argued that the incremental changes of urban development and flood defence could alter the stability of river channels, the heights or frequency of floods and the volume of base flow in rivers, “*the crux of the urban water management problem is that benefits gained upstream may lead to costs downstream..... Consequently the planning decisions and construction activities of one authority or agency may produce hazards and even losses for another authority or agency*”. Geographers also referenced the valid form of hydrologic planning of early floodplain restoration schemes, this time including a city centre in New South Wales, Australia where the “*acquisition of flood-plain land as public open space and playing fields, and to the creation of a riverine green belt through the city which approaches the planner's ideal of vegetated open space along urban streams*” (section 4.7).

Planners – They Build on Floodplains, Don't They?

Patrick Abercrombie, planner, wrote a letter to the Times, 1934, questioning the grandiose engineering schemes of the Catchment Boards, and proposing a policy solution exactly seven decades ahead of Defra “*to increase the capacity of the flood meadows*” (section 4.2). Town planners at Oxford were advised to make every effort to “*maintain, as open spaces and playgrounds, flood areas near the city, to preserve the natural beauty of the countryside*”. Just two years later, following a major flood event in 1928, the Times Correspondent remarked upon the wisdom of the Oxford town planner, as the green belt marked out the flood as if it were a moat. Please note, in advance of a comment in section 7.1 (p197), early planners did not live on a “*flat earth*” and their plans did indeed boast contours, the Berkshire Town Planning Committee in 1930 recommending that “*land falling below the 250ft contour should be kept free of any buildings other than those for agricultural purposes*” (section 4.3).

National Government prescription for planners to reduce ‘constraints on development’ came in waves, in the 1960s, 70s and 80s. In the 1960s planners faced calls from the Minister for Housing and Local Government to “*do more to meet the challenge of a booming population and a bursting economy....planners must not be afraid to experiment*”, with local government reorganisation to provide a more efficient machine for development. The

Town and Country Planning Act 1971 aimed to intensify and streamline economic growth (Grove-White, 1991), with ever intensive lobbying by Developer interest groups. The Conservative Government looked to “reduce bureaucratic obstacles to the freer working of markets” in the early 1980s and “*radically recalibrate and refocus the planning system to encourage the freer and more creative play of market forces*” to by-pass local authority ‘obstructionism’. The case of Surrey County Council, traced through the decades highlights the consequences. The council had created legislation in 1934 to prohibit or restrict the erection of houses on land liable to flooding, and opposed the development on the floodplain at Hurst Park in the 60s, that the developers termed would be “*quite beautiful and not at all what some people seemed to fear*”. (The Thames Landscape Strategy (2006) - “*the incursions of 1960s housing into the Park, including a particularly dominant block of flats, and modern office and residential buildings into the Barge Walk have detracted from the sense of space. The linear fence division, between Hurst Park and the former race course land, leaves the space feeling rather unresolved and could be softened*” (p167).) Surrey has not been singled out purposefully for analysis, the county featured heavily in the media. The authority framed a new policy for control of development on the floodplain in 1965, to the extent of meeting the ideal of “*the complete clearance of the flood plains and washlands*”. Yet it was Surrey that received the headline - “*Dealing with the flood threat: where were the planners?*” (from a resident who had bought a house on Ditton ‘Island’ in the centre of the Thames). As Grove-White (1991) later noted, through ‘planning by appeal’ planning professionals became increasingly unsettled and disoriented, rendered relatively unresponsive and marginalised to new patterns of environmental perspective. Following the ministers’ “assaults” of the early 1980s, in addition to the continued pressure on local government finance, they were unable to assimilate new awareness and concerns of environmental groups within their revised arrangements of duties and responsibilities (*ibid*, p36).

Hajer (1997) has highlighted that environmental discourse should not be approached as a coherent whole, but is better seen as inherently contradictory and ambivalent. As contemporary media and academia continue to point the finger at ‘planners’ for problems following flood events, the analysis has uncovered a more nuanced and complex network. As Jager and Maier (2009) state, one of the aims of discourse analysis is to disentangle this net; “it is necessary to analyse a longer period of time in order to identify the changes, ruptures, ebbings and recurrences of a discourse strand” (p51).

The policy discourse of 'flood defence' can be seen to be deeply rooted in historical traditions, yet we know from the introductory chapter that this discourse has been contested 'successfully' in recent years. Chapter 5 now proceeds from the 1980s to the turn of the 21st century, to present an institutional lineage of how, when and from where the 'recent' concepts on sustainable and integrated approaches to flood risk management emerged. We now know that ecologists, geographers and, unpredictably, planners have already contested the hegemonic discourse. Institutional structures constrained the actions of planners. Yet in the 1970s British geographers were accused to be "*hidden away in their adjectival boxes*" and "*seldom developing team approaches to these applied problems*", whilst an "*immensely potent force was being lost*" in ecologists as they "*showed little initiative to approach the issues through experience*". Was it these same disciplines, or others, that have somehow achieved influence in the flooding policy arena to have their claims recognised as a policy problem? How have contesting actors used discourse to shape a new reality? Chapter 5 will investigate how change came about, using social science theory to illuminate the shifting conceptualizations of environmental problems.

5

From ‘Drains & Swamps’ to ‘Rivers & Wetlands’: the Turn in the Discourse

Economists have a great deal more political clout than environmentalists. Economists have the Treasury, as their Cabinet Overlord. Environmentalists have the Department of the Environment. Enough said

The final reason, from ‘9 good reasons why environmentalists should call themselves economists (and one apparently bad one)’

The Robertsbridge Group, 2012

Contesting voices, belonging to geographers, ecologists and planners, had intermittently punctuated the hegemonic flood defence discourse in the half century from the Land Drainage Act of 1930, to the 1980s. Chapter 5 picks up the historical discourse analysis from the 1980s, to present an institutional analysis to identify the discursive renewal within the neighbouring policy sectors of water management and planning. The rise in ‘power’ of contesting voices will be traced; how their alternative concepts to deal with flood risk management emerged, where the concepts were first developed, from which disciplines and how they were able to gain a foothold in the Government’s strategic approach, ‘making space for water’, by the turn of the century. Against wider shifts in governance, including calls for ‘sustainable development’, the key forces and factors that brought about the demand for floodplain restoration will be identified, paying attention to the new actors and discourse coalitions shaping around the flood risk ‘problem’ on English floodplains. Chapter 5 answers research question 2 – how, why and from whom has the discourse on floodplain restoration emerged?

5.1 Initial Signs of ‘Shifts in Governance’

The influential World Conservation Strategy was published in 1980². Whereas in the 1960s and 70s environmental policy discourse referred to ‘nature’, ‘conservation’, ‘ecology’ and ‘biodiversity’, the ill-defined usage of ‘sustainable development’ made its entrance to the global discourse (Luke, 1995). The Strategy recognised two features that characterised “*our time*”, the “*almost limitless capacity of human beings for building and creation, matched by equally great powers of destruction and annihilation*” (p1). The toll of this approach, the strategy argued, was now apparent in a long list of hazards and disasters (flood ‘hazard’ not featuring on the list at this time). The strategy explicitly argued for a new international economic order, with a new environmental ethic, with new “*sustainable*” modes of development as the rule rather than the exception. In parallel with the shift to sustainability, neo-liberalism also emerged to dominate western politics in the 1980s, Thomas Woodrow Wilson, the father of modern public administration, stating “*government should be run like a business*” (Schafritz and Hyde, 1992, in Arts and Leroy, 2006). Ideas gained momentum in the late 80s under ‘New Public Management’, which saw business managerialism transferred into the public sector (Arts and Leroy, 2006; Bottery, 1996). Described as one of the most striking trends in public administration (Hood, 1991 in Bottery, 1996), all efforts of government were geared to the effective execution of public tasks with such demands as ‘necessity’, ‘efficiency’, ‘implementation capacity’, ‘maintainability’ and ‘simplicity’ (Bottery, 1996). Government ‘outputs’ were increasingly evaluated with explicit standards and ‘performance indicators’, shifts to greater ‘competition’ in the public sector and prudence in resource use (Arts and Leroy, 2006; Bottery, 1996). Arts (2006) saw economic managerial criteria used “not only as a means to improve government, but also as a *goal* of government in itself”.

Calls for a ‘Revision’ and ‘Mitigation’ of Engineering Practices

The UK Wildlife and Countryside Act 1981 had bestowed upon various public agencies a duty to have regard for nature conservation. Ecological damage, along with the loss of landscape value and fisheries, were said to be the “*driving forces for revision of engineering practices to retain or restore a greater diversity of habitats*” (Brookes, Gregory & Dawson 1983; Countryside Commission 1988; Eaton 1986; Mason, Macdonald & Hussey 1984;

² The report was authored by the International Union for the Conservation of Nature, the World Wildlife Fund together with the UNEP, and was co-authored with the FAO and UNESCO.

Purseglove 1983; Swales 1982, 1988 in Eaton, 1989, p844). It was claimed that prior to the Act “*an engineer could have two minutes silence on a river bank and destroy absolutely every last living thing. Providing they had two minutes silence they could say, ‘well, I had due regard, but then I killed them all’*” (Interviewee from Adams *et al.*, 2004). Land drainage was seen to be the largest single influence in the loss of waterplant communities and in great reductions of populations of some species that protection was “*urgently required for their conservation*” (Nature Conservancy Council 1984; Eaton, 1989, p844). MAFF’s Section 24 surveys were framed by ecologists as a source of grant funding to eliminate all wetland habitats in England (Scrase, 2005). Bowers (1983) stated “*the comprehensiveness of these surveys is such that there is probably little or no agricultural land in England and Wales of more than 20 or 30 ha in extent subject to fluvial or tidal flooding with a return frequency of greater than 1 year in ten that is not listed as a “problem” in a section 24(5) survey and for which a solution is not proposed*” (p228-229). Dr Brooker, District Scientist of the Welsh Water Authority also wrote in the Geographical Journal (1985) on the ecological effects of channelisation. Brooker noted that to date there had been few published studies of the ecological effects of such schemes, his own detailed study concluded that river corridors formed one of the major linear habitats in the UK and sustained important wildlife resources. Channelisation could result in changes which effect the in-stream and bankside ecology, including fish populations, devastation to bankside trees and ground cover, riverine birds, the continuing decline of the otter. Brooker’s recommendations fell short of restricting or ending further channelisation, but instead stated the need to “*describe, more fully, wildlife resources in river corridors, both in-stream and bankside, and to explore their relationships with habitat features in order to provide scientifically robust management recommendations designed to mitigate the effects of channelisation*” (*ibid*, p67).

Brooker’s paper of 1985 had been presented at a joint meeting of the Institute of Engineers (ICE) and the Royal Geographical Society (RGS). Study of the other papers presented at the meeting and resulting discussion provide fascinating insight into the competing discourses at the time between the disciplines, ecologists, geographers and engineers. The Senior Fisheries Officer from Thames Water Authority, Dr Spillett (currently Trustee of the Thames Rivers Restoration Trust) stated “*there is no doubt that such schemes can have severe deleterious effects on the ecology of a river; most Water Industry biologists have firsthand experience of this and changes in fauna and flora are recorded in the American literature*”, he continued that “*in the past, engineers have carried out drainage work with little*

regard for the environment but the situation has changed considerably in the past few years and we now have much better liaison and collaboration between biologists and engineering staff” (*ibid*, p72-73). He emphasised several points in the success of any channelization project, including full and detailed collaboration with good communication procedures in the design and planning stages to include fisheries, biology and conservation aspects, modifications in the engineering design to include retention or creation of pool/riffle regimes; small weirs, groynes and deflectors; asymmetric banks; two-stage channels; introduction of artificial substrates and tree planting and landscaping (*ibid*, p73). He also stated that “*despite good consultation at management level, it is our experience that translation of plans into reality can be achieved only by having a biologist actually working closely with the work gangs*” (*ibid*, p73). Speaking about the impact of river channelization, Mr. Wyllie from Thames Water Authority stated that “*as a Civil Engineer, I tend to consider the impact on people rather than that on the ecology*” he spoke of the channelization of the River Lee which “*cannot be claimed to be a conservationist's dream, but the locality with factories, pylons and power stations benefits substantially*” (*ibid*). A consultant engineer enquired about Mr. Brooke’s presentation slide of a “*devastating situation*”; a newly pioneered channel with just a solitary mature tree left standing, the rest having been cleared; “*Does he consider that such a tree should have been left intact?*” (*ibid*, p74). The engineer asked if pollarding would be acceptable to “*environmentalists*”, as he explained the presence of mature trees in or near a river bank, especially where temporary dams may be formed by accumulation of boulders and fallen trees, could lead to lethal results; it “*was for that very reason the Lynmouth flood caused so much more devastation than might otherwise have been the case*” (*ibid*, p74).

The Rise of New Public Management - ‘Rolling Back’ the Flood Defences

In England, reflecting the changing political economy, the Conservative Government brought greater emphasis on ‘value for money’ and began to ‘role back the state’. Institutional arrangements in the scene of flood ‘hazard management’ came under scrutiny, as Margaret Thatcher’s government increased attention to the “*worthwhileness*” of government investment in flood alleviation (Penning-Rowsell and Handmer, 1988). Due to “*government antipathy towards both local government and the Whitehall bureaucracy*” the flood alleviation role of Internal Drainage Boards and District Councils was reviewed, conjectured to mean a possible loss of some of the influence traditionally exerted by the Ministry of Agriculture, Fisheries and Food (MAFF), to date the central government agency concerned with flood defence in England and Wales (Penning-Rowsell and

Handmer, 1986 in Penning Rowsell and Handmer, 1988). A government Green Paper (Cmnd. 3449, 1988) reviewed a number of alternatives, with proposals to bring flood alleviation more under control of the water industry rather than agriculture, integrated with overarching government objectives concerning public expenditure, conservation and 'urban' areas (Eaton, 1989; Penning Rowsell and Handmer, 1988). This reinforced a pre-existing trend, caused by the decline in MAFF grant levels for flood alleviation investment, which had left MAFF with less of an influence over the policies of regional and local agencies (*ibid*). The political influence of farming interests had waned in the 1980s; agricultural surpluses and European Economic Community quota limits on cereal had reduced the economic justification for land drainage expenditure, and along with the concern for wetland preservation had led to cuts in government funding for land drainage (House of Commons Official Report, 1984 in Eaton, 1989). Although support remained for engineering flood defence works, increasing attention was being given to certain 'non-structural' approaches, principally flood warning systems (Collinge and Kirby, 1987 in Penning Rowsell and Handmer, 1988). This trend was seen to be particularly evident where traditional structural solutions were too costly to justify, where lives were at risk from rapid flood onset, and also "*where non-structural solutions are less unacceptable than extensive river engineering works to a more environmentally sensitive public*" (Penning Rowsell and Handmer, 1988, p215). Although 'natural' flood risk management solutions were not yet featuring strongly in the water policy domain, the reorganisation of the water industry was viewed with some optimism by ecologists, the speed of change and trend in policies thought "*must surely influence*" and "*affect the future ecology of British freshwaters*" (Eaton, 1989, p846).

Water Privatisation but Stability in Flood Defence

The Conservative government set out their plans for the privatisation of the water industry in 1985. However, the conjectured loss of power from MAFF did not materialise; flood alleviation and land drainage were kept separate from the newly privatised Water Service Companies. Flood alleviation's lack of commercial profitability was cited, although it was thought that the "*farming community and the Ministry no doubt supported this position to safeguard their particular interests*" (Penning Rowsell and Handmer, 1988, p217). The government had initially proposed to privatise the Water Authorities with all of their previous functions intact, leaving them with minimal supervision, but this had provoked strong opposition. The Country Land Owners' Association had

joined with the Confederation of British Industry “*in rejecting the White Paper idea that privatized water public limited companies could monitor pollution and protect the environment by regulating other private concerns*” (The Times, 1987). Mr Ridley, the Environment Secretary, had apparently become increasingly concerned “*by the role of the water authorities as both poachers and gamekeepers in this field*”, under revised proposals from the Environment Department, privatisation was to go ahead, with the water authorities responsible for water supply and sewage alone. Despite the opposition of the Water Authorities, who thought the unity of water functions should be retained within catchment areas, public sector responsibility for flood alleviation was retained (Penning Rowsell and Handmer, 1988). These functions were to be implemented by a ‘National Rivers Authority’ (NRA), also responsible for environmental regulation, with a regional structure to match the privatised Water Authorities.

The NRA’s remit incorporated pollution control, recreation and fisheries. Funds for land drainage and flood defence remained ring-fenced. The Land Drainage Committees, to operate under the NRA, were renamed ‘Regional Flood Defence Committees’. They were charged with a greater emphasis on environmental protection, but continued to receive grants from MAFF. MAFF was also responsible for the oversight of the other drainage authorities, the IDBs and local authorities, who retained their land drainage functions (Scrase, 2005). Penning Rowsell and Handmer (1988) believed that in “*this interplay of political forces what should not be underestimated is the power of vested interests in the administration of flood alleviation*” (p217). The NRA became operational in 1989, allegedly as the “*strongest environmental protection agency in Europe at a time when environmental issues are attracting increasing public concern and awareness*” (The Times, 1989).

5.2 Enter ‘Sustainable Development’ to the Global Discourse

The ‘Win-Win’ Brundtland Report

Over the next decade the term ‘sustainable development’ came to dominate both expert and media discourses, ultimately consolidated with the publication of the Brundtland Report, ‘Our Common Future’ in 1987 (WCED, 1987) and its now ubiquitously quoted definition of the concept. Taking a less often quoted statement, the Brundtland Report

can be seen to make an assumption about a positive-sum relationship between distributive justice, economic growth and environmental protection (Davoudi, 2012); *“In essence, sustainable development is a process of change in which exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet needs and aspirations”* (WCED, 1987, p. 46). This made a distinct break from the conservationist’s discourse of ‘limits’ and ‘survival’ (Davoudi, 2012; Hajer, 1995). Although the report recognised *“ultimate limits”*, it pronounced *“Growth has no set limits in terms of population or resources use beyond which lies ecological disaster”*. The authors had faith in human ingenuity and technological solutions: *“accumulation of knowledge and the development of technology can enhance the carrying capacity of the resources base”* (WCED, 1987, p. 45 in Davoudi, 2012). It was this ‘win-win’ rhetoric that drew wide ranging support and global endorsement of the Bruntland report, from here *“the wheels of public concern, governmental politics, and policy-making geared into one another to produce a new consensus on how to conceptualize the environmental problem, its roots, and its solutions”* (Hajer, 1995, p101). Yet according to the economist Tisdell (1988), in its conception, the aim for a ‘sustainable’ society in which we could achieve the virtues of sustainable economic development and sustainable productive systems, reflected the outlook of ecologists rather than the majority of economists.

The ‘Green House Summer’ affects the Political Discourse Plane

Environmental concerns had for the most part by-passed the country’s mainstream political parties, but now it was in their interests to pay attention and take them seriously; the ‘environment’ thus also emerged on the British mainstream political agenda (Grove-White, 1991). Attention to the environment had escalated with the intensity of the heat and drought of the ‘greenhouse summer of ’88’ (Ungar, 1992). Global warming had been on the science agenda for over two decades and activities by claims makers had not shown any shift in activity, but: *“in 1988, nature did more for the notoriety of global warming in fifteen weeks than any of us [scientists] or the sympathetic journalists and politicians were able to do in the previous fifteen years”* (Schneider, 1989, p203 in Ungar, 1992). The scientists’ claims became viable after that summer and led to the ‘greenhouse effect’ and ‘global warming’ becoming household terms. Political demands were raised and *“politicians suddenly ‘discovered’ the environment and in a bandwagon effect made promises they later were forced to recant”* (Ungar, 1992, p489).

Thatcher placed her “*imprimatur on the reality of the environmental problematic*” in a historic ‘green’ speech to the Royal Society in September 1988, just three weeks before the Conservative Party Conference (Grove-White, 1992, p45). Although the economic recession was still the number one concern, the Government drew on the rhetoric of ecological modernisation to show its commitment to environmental care (Hajer, 1997). In May 1990, Margaret Thatcher opened the Hadley Centre for Climate Prediction and Research in Bracknell. In her opening speech on global warming, she proclaimed: “*Governments and international organizations in every part of the world are going to have to sit up and take notice and respond*” (Prins, 1990). She returned to a property-owning metaphor, first used in what Prins (1990) terms her “Green” speech to the Royal Society in 1988, when she described her generation as “*having a full repairing lease on this Earth. With the work done by the IPCC, we can now say that we have the Surveyor’s Report and it shows that there are faults and that the repair work needs to start without delay ... We would be taking a great risk with future generations if, having received this early warning, we did nothing about it or just took the attitude, ‘Well! It will see me out!’*” (*ibid*). Thatcher, considered a scientifically literate politician as former industrial chemist, “*had articulated the problem clearly*” but when she turned to concrete proposals “*her solution-to permit the unfettered operation of the free market-was incommensurate with the seriousness of the diagnosis*” (*ibid*, p725). She offered to cut British carbon dioxide emissions by up to 30 per cent of ‘presently projected levels’ by 2005, which actually represented a net increase on current levels, this “*appeared weasel-worded, an attempt to appease Green anxieties while preserving a commitment to what Mrs Thatcher had earlier and elsewhere called the ‘great car economy’*” (*ibid*). Mrs Thatcher’s speech to the United Nations the previous year, 1989, “*had revealed the same clarity, and the same sharp discontinuity between diagnosis and prescribed remedy, in the eyes of many Third World and environmentalist commentators*” (*ibid*). Thatcher subsequently called green activists ‘*airy-fairy*’, stressing that environmentalism must be balanced by economic growth (Milne, 1990 in Ungar, 1992).

Political environmental rhetoric spilled into the water sector, again, water quality. Michael Howard, the new Minister for Water and Planning under the Thatcher administration, spoke at the opening session of the 1988 Water Pollution Control Federation Conference in Dallas, US; “*the need to give a higher priority to environmental concerns has become a human imperative. It is one which must be met. The water industry has a key role to play in this process*” (Howard, 1989). A growing public desire for a cleaner environment and for wildlife conservation, also increasing leisure time and a demand for water based

recreational facilities altered attitudes towards river pollution, put pressures on industry and local authorities to invest in water quality control (Eaton, 1989) and led to new actors entering the stage. Mike Taylor, head of the conservation branch of the Countryside Commission, was quoted in the *Times*, “*to be fair, problems in the past were caused by a different generation of engineers with a different approach*”, but despite their past, the water authorities did seem to “*be putting their money where their collective mouth is*”, Severn Trent had created a wildlife oasis on a sewage works in the urban Black Country and ‘Project Kingfisher’ was transforming the River Cole that flows through suburban Birmingham (the Cole’s floodplain was encroached upon in the 1960s, section 4.5). Wessex Water, the article reported, was the first authority in the country to appoint a staff conservation officer, with a master’s degree in landscape ecology (*ibid*).

Broadening the Academic Base

Research from major government sponsored reviews recommended an ‘integrated’ evaluation of the social, economic and environmental acceptability of river management works, also stressing the need for more studies of the ‘institutions’ of flood hazard management, to guide the future direction of changing institutional arrangements (Penning Rowsell and Handmer, 1988). Whereas the conventional disciplines in flood risk management had been hydrology, hydraulics, and structural engineering with restricted input from other disciplines, the drivers of more cost-effective design and public pressure to decrease reliance on environmentally insensitive engineering solutions, started to broaden the scope and disciplinary base. The result of the current trends were seen by Edmund Penning-Rowsell (Professor of Geography) and John Handmer (Research Fellow at the Centre for Resource and Environmental Studies, Australia) (1988) as an “*increasingly interdisciplinary field*” with more scope “*for geographical research, to complement the traditional emphasis on engineering and hydrology*”. It was thought that the type of research pioneered by geographers would receive greater recognition, “*analysing flood hazard management as fundamentally concerned with social and economic problems rather than merely with engineering solutions*” (p218). Janet Hooke, Editor of ‘Geomorphology in Environmental Planning’ (1988) saw geomorphologists as having skills which are vital for environmental planners, in helping reduce the environmental impacts of development and predict the environmental effects of particular policies; “*the trouble is that too few environmental managers realise this fact*” (Haigh, 1989, p241). To date, it was said that geomorphological research had contributed little to the formulation of

environmental policy in Britain, not finding a way “*out of the academic ghetto*” to compete successfully for environmental research contracts in a market “*still dominated by the consultant engineering firms and government agencies*” and under the influence of the “*self serving committees of the Research Councils*” (*ibid*, p241). Workers whose contributions fit within the existing institutional and planning frameworks were seen to have a clear advantage within the complex legislation seen to constrain British environmental planning. The legislative landscape was about to change.

5.3 Integrated Water Resource Management

Initial EU Policy Levers

In 1988 the European EIA Directive (85/337/EEC) was implemented for flood defence works under the Town and Country Planning (Assessment of Environmental Effects) Regulations for ‘canalisation or flood relief works’; and the Land Drainage Improvement Works (Assessment of Environmental Effects) Regulations for works to “*deepen, widen, straighten or otherwise improve any existing watercourse...or raise, widen or otherwise improve any existing drainage work*” (para. 2.1). Under the new EIA regulations of 1988, the NRA had to evaluate the geomorphological conservation value of a river environment prior to operations, and furthermore, take into consideration ways of improving the geomorphological value of the riverine environment as a ‘by-product’ of the operations (Downs and Thorne, 1996). The implementation of the Habitats Directive (92/43/EC) also gave ecology and ecologists some “*teeth*” to hold their own in the mainstream of river management (Adams *et al.*, 2004). However, Scrase (2005) reports that there was an initial loss of good faith among some river engineers, who considered that they had already been voluntarily working with conservation interests, and resented being required to “*jump through hoops*”. In some parts of the country, engineers flatly refused to deal with conservation interests at all until they were legally required to do so (Newbold, 2003, in Scrase, 2005). The development of flood defence options remained to be driven firstly by technical considerations, and secondly by the need to demonstrate a positive benefit-cost ratio (Scrase, 2005). The EIA regulations only required details to be provided on the alternative projects that were considered, and very often the alternatives considered were only minor variations on one option (Brookes, 1999 in Scrase 2005).

Amongst other common failings Brookes (1999) also identified an excessive faith (also seen in road construction EIAs) that ecologically rich habitats could be simply translocated or recreated elsewhere (in Scrase, 2005). ‘Sustainable’ water management discourse was about to ratchet up another level in the global discourse, carrying ‘floodplain restoration’ with it.

Sustainability Percolates International Water Management

The ‘Dublin Statement on water and sustainable development’ emerged early in 1992, from the International Conference on Water and the Environment in Ireland. In what is now interpreted as the call for ‘integrated water resource management’ the statement declared that concerted action was required from local, national, and international levels to reverse trends of overconsumption, pollution, and rising threats both from floods and from droughts; “*Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater area*” (Mitchell, 2005). In taking the statement to Rio de Janeiro later in the year, integrated water resource management (IWRM) emerged as a significant concept from the United Nations Conference on Environment and Development, the first Earth Summit. The wider concepts of sustainability “*percolated through government departments*” following the Earth Summit in 1992 to influence flood defence thinking and raised the concept of ‘floodplain restoration’ (*ibid*, p1934).

At an international seminar on Land and Water integration in ‘natural resource management’ in Stockholm, October 1994, Falkenmark and Rockström (1996) saw the management of land and water as implemented in different arenas, by different actors with different mental images of the resource base. Land was seen as a more or less ‘dry’ geographic entity, water appeared only as blue areas on the land use allocation map, best dealt with in isolation from land as a “*sort of add-on technical issue*” for civil and sanitation engineers and hydrologists. Although seen as highly important for the achievement of environmentally sustainable development, at this time only few models were in place to seek best practice and experience for an ‘integrated’ approach (*ibid*). The crucial level for an integrated approach was seen to be the drainage basin, the key tool ‘*integrated planning*’, supported by national policies and legislation, integrating the mutually dependent sectors of land and water (*ibid*). The Seminar drew on the recently issued

World Bank water-resources policy, which they noted stressed the need for having an integrated land/water perspective and also Agenda 21, with the key component of strong stakeholder involvement. In “*striving towards the development of shared visions*”, integration was to include a range of policy instruments, greater community involvement, reduced environmental effects and coordination between the many government agencies that were involved in this policy arena (Myers and White 1993; Penning-Rowsell and Fordham 1994 in Edward Penning-Rowsell, 1996).

‘Urban’ Sustainability and Water Management

The sustainability discourse began to make tracks in urban circles, the conference on European Sustainable Cities and Towns in Aalborg, 1994, considered an important step towards the achievement of ‘urban’ sustainability (Mitchell, 2005). The ensuing EU Urban Environment Expert Group’s First Policy Report and Good Practice Guide for the application of the concept of sustainability in urban areas sought to encourage “*both horizontal and vertical integration in policy and organisational processes.....in order to realise the synergies of further integration of social, environmental and economic dimensions of sustainability and therefore stimulate the process towards sustainability*” (EU, 1996, p1). Whilst recognising a movement towards integration between policy fields or sectors had started, the report stressed there was “*however, a need to further develop the capability and experience of professionals to work in an interdisciplinary manner, and to increase their understanding of policy fields and sectors other than their own*” (*ibid*). This included water, flooding and a form of floodplain restoration specifically. The now well rehearsed storyline; “*the January 1995 floods in north western Europe were the legacy of an unsustainable past. The principal causes ranged from excessively fast rain to surface water flow and river beds too narrow to accommodate the quantity of water*”. The accumulation of relatively modest human interventions in river basins, such as cutting down small areas of woodland, urban expansion and the building of new settlements, straightening the courses of streams, laying drains for agricultural field improvement were all seen as the contributors to the floods and their environmental consequences, highlighting the “*need for sustainable management of the water system*”. The high proportion of impermeable surfaces in cities and pressure on “*capital intensive waste water treatment systems*” were to be counterbalanced by the “*ecological solution*” of creating ponds, ditches and wetlands “*which allow the retention of storm water, rather than eliminating it as quickly as possible through the waste water systems*”. This retention was seen as a “*multiplier solution*” also

enhancing the natural purification of the water, enriching the flora and fauna and having a “social impact through the recreational value that water elements add to the environment”.

New Institutional Arrangements

In response to the call for a more integrated, strategic approach, having operated from 1989, in 1995 the NRA merged with Her Majesty’s Inspectorate of Pollution and the waste authorities, to promote ‘integrated’ environmental regulation across water, air and land in the newly formed ‘Environment Agency and Environment Agency Wales’ (EAEW). EAEW was given a general duty to promote ‘sustainable development’. But yet again institutional arrangements for land drainage and flood defence were left largely unchanged (Scrase, 2005). The Association of Drainage Authorities argued successfully for ‘the Flood Defence Committees’ to retain their executive powers and for flood defence funding being ring-fenced for that exclusive purpose (ADA, 1995: 11). Flood ‘defence’ measures continued to be implemented at a regional and local level by flood defence committees, internal drainage boards and local authorities (within the institutional structure now remaining intact from the 1930s) (Scrase and Sheate, 2005). From 1993 MAFF’s official aim of flood defence policy however shifted from rural to urban priorities, “to reduce risks to people and the developed and natural environment from flooding and coastal erosion by encouraging the provision of adequate, technically, environmentally and economically sound and sustainable flood and coastal defence measures”. The new emphasis on reducing flood risk to people was reflected in the prioritisation of objectives as follows: flood warning systems; urban coast defence; rural coastal defence; existing rural flood defence and land drainage schemes; and new rural schemes with the lowest priority.

Moving from ‘Mitigation’ to ‘Restoration’

The contesting voices to engineering works grew louder into the 1990s, the international discourse had drawn attention to the manner in which extensive human alteration of river flows had resulted in wide-spread geomorphic and ecological changes (Poff *et al*, 1997). After having “expended great effort to tame rivers for transportation, water supply, flood control, agriculture, and power generation” it was now being recognized that this harnessing of streams and rivers had come at a “great cost” (Poff *et al*, 1997). There was growing concern amongst biologists and ‘natural resource’ managers for what was now seen as ‘river exploitation’, resulting in extensive ecological degradation, loss of biological diversity

or sustenance of healthy ecosystems that were seen to provide important ‘goods and services’ (Allan and Flecker 1993, Hughes and Noss 1992, Karr et al. 1985, TNC 1996, Williams et al. 1996 in Poff *et al.*, 1997). Wetland ecosystems were recognised to be “*among the most threatened of all environmental resources*” (Turner, 1991, p59). Ecological studies showing the “*widespread loss of natural habitat and acute aquatic wildlife conservation problems*” were seen to have a major contribution in water management, including the move towards ‘restoration’ of physical habitats (Eaton, 1989, p835). Furthermore, groundwater depletion, decline in water quality and availability, and more frequent and intense flooding were also increasingly recognized as consequences of current river management and development policies (Abramovitz 1996, Collier et al. 1996, Naiman et al. 1995 in Poff *et al.*, 1997). Links were drawn between current flood defence practices and *increased* flooding, accompanied by a sympathetic media, modification and mitigation of existing flood defence activities moved to stronger calls for conservation and restoration of physical habitats, albeit compromising with the dominant ‘new public management’ discourse.

In the early 1990s, pricing of the European Environment was inspired by the first and second annual conferences of the European Association of Environmental and Resource Economists in Venice (1990) and Stockholm (1991) (Duffield, 1994). As unpriced resources were largely viewed as ‘value-less’ by various decision makers, the aim of the environmental economists was to identify a dollar value for important resources, including clean water, intact natural environments and fish, that were not priced by markets (*ibid*). Turner (1991) saw the threat manifested as “*overutilization*” of the total wetlands “*stock*” and sustainable economic development was the solution, “*sustainable utilization and the maintenance of a sustainable flow of income derived from the wetlands stock*” for which “*extended cost benefit analysis can play an important role in the formulation of a sustainable management strategy for wetlands*” (p59).

5.4 River and Floodplain Restoration

The shifts in thinking about flood defence and floodplain management flowed to the wider community in the 1990s, including floodplain residents, land users and the media (Eden et al, 2000), the rising claims against ongoing land/water ‘mismanagement’ eliciting widespread concern for the conservation and restoration of healthy river

ecosystems (Falkenmark and Rockström, 1996). The strong movement emerging, ‘designing-with-nature’ and rehabilitating channels morphologically damaged or environmentally degraded by unsympathetic past management techniques, led to the creation of the UK River Restoration Project in 1991 (Downs and Thorne, 1996). The River Restoration Centre (RRC) was established shortly afterwards in 1994, which together with work by the Thames Region EA, became an increasingly important element in ideas about river management (Adams *et al.*, 2004, p1933). After leading the earlier ‘fight’ against English and Welsh rivers (chapter 4), in the 1990s the media began to lament their death.

The Media Turns

The Times, in the ‘drought year’ of 1992, documented southern Britain’s “*dying rivers*”: “*From the Wallop Brook in Hampshire to the Little Ouse in the Fens, streams whose names evoke the well-watered countryside of times past are drying up and disappearing*” (The Times, 1992). One of the rivers the Times (1992) described to be on a “*life support system*” was the Ver, passing through St Albans in the Thames Valley. The Ver Valley Society had been campaigning to save the river since 1976, the vice-chairman was quoted: “*They took the last dozen trout out of the puddle under the mill in February. They were all dead*” (*ibid*). The NRA had agreed to implement a scheme Dr Ted Hollis (University College, London, see section 4.8), had devised, “*co-operation, not confrontation*” had been the way forward, “*but we were clear that what we wanted was not just water running down the river bed. We want to see the water table and the wetland habitats of springs, ponds and wet meadows that are part of our heritage, fully restored and preserved*” (*ibid*). The Times documented the Bourne, with wells that had been dry for years and where the Bourne should start, there was “*barely enough water to fill a garden pond*” (*ibid*). Quoting the local legend that when the bourne did flow it would presage some great calamity and hence was known as the “*woe-water*”: “*Come back, woe-water. All is forgiven. Contrary to the old nickname, there would be great joy if it ever flowed again*” (The Times, 1992). The RRC featured in the news in July 1995 detailing their “*pioneering*” project, that had received planning permission, to restore a mile-and-a-quarter stretch of the River Cole, near Swindon, backed by the National Trust (the land owner), the National Rivers Authority, English Nature and the Countryside Commission. The driver for the project was ecology; encouraging bankside vegetation to provide better shelter for fish, birds, water voles and other wildlife, reed and willow beds to improve water quality, to

encourage regular winter flooding of adjacent fields to create meadows “*rich in bees, butterflies and wild plants*” (The Times, 1995).

The drivers for change until this point were to ‘mitigate’ the impacts of engineering works, and more recently, a move to ‘restore degraded ecosystems’ by rehabilitating geomorphological diversity and improving water quality. The “*blossoming of natural flow restoration projects*” (Poff *et al*, 1997, p780) at this time were for specific ecological benefits, including riparian vegetation, native trees, wetland functions, waterfowl and mostly recovery and enhancement of fisheries, including endangered species (Sparks *et al*, 1990; Kern, 1992; Henry & Amoros, 1995). The influential ‘Taming the Flood’ by Jeremy Purseglove had been published in 1988, which began to affect both public and professional ‘popular’ ideology regarding ‘floods and floodplains’ in England (Adams *et al*, 2004; Scrase, 2005). Purseglove described the state of England’s watercourses; “*many towns and cities contain streams which are either culverted or flow between concrete-lined banks. In fertile lowlands at risk of being flooded, rivers typically flow in enlarged trapezoidal channels set within flood banks*”. The ‘floodplain restoration’ discourse “*gained ground in public debate about the protection of urban areas from the mid-1990s*” (Adams *et al*, 2004, p1932).

Floodplain Restoration

Still with the ‘ecologically inspired’ media, Oliver Tickell in the Times spoke of one of England’s more charming qualities in its inability to cope with the weather: “*A few dry summer months, and we are stricken by drought. A few wet winter weeks, and dreadful flood is the result*” (The Times, 1994). He told his readers how, 50 years ago, almost all our rain would have fallen into woods and fields and pastures, most of it sinking into the ground on its way to the nearest water course: “*After heavy rain, rivers would not so much have burst their banks as spilled out over swamps, marshes, and meadows. No disaster, this was part of the seasonal cycle to which the land was accustomed..... Houses were built on high ground, arable crops were grown on well-drained land, and the flood plains, made fertile by sediment, were reserved for hay making and summer grazing.....With the floods draining only slowly into the main rivers, flows were reduced in winter and maintained in summer*” (*ibid*). Later in the same year, the Times (1994) referenced the “*ferocious programme of land drainage*” by the agriculture ministry, farmers, drainage authorities and internal drainage boards, who had “*dredged and culverted miles of river, stream and brook, converting water meadows and flood pastures into arable crop land*”. A “*no less aggressive process of urbanisation*” that had “*ripped across the newly civilised flood plains*”

following the drainage schemes, “*so conveniently flat for roads, car parks, factories, houses and supermarkets*” that “*basic truths were forgotten.....So rainwater that would have dispersed harmlessly is now accelerated downstream in unprecedented volumes. And at the narrowing of the funnel, something has to give.*” The media’s solution; more power for the NRA to prevent planners from developing flood plains, a veto over such flood plain developments and “*the money to buy up and destroy development that should never have been allowed*” (*ibid*).

This growing discourse was not supported in all circles, and traditional voices spoke out in “Towards a Rural Policy: a Vision for the 21st Century” (1995), the Country Landowners Association called for a Government department for “*rural affairs*”, to absorb the responsibilities of the Ministry of Agriculture, Fisheries and Food. Although the association recognised that farmers would remain the focus of all countryside policy with their responsibility for food production and land stewardship, they believed jobs outside farming were also needed. Their report claimed that the rural economy was hampered by over-regulation by the Government and the European Union, the association feared that the designation of large areas of countryside for landscape or wildlife value would be misused through the planning system to constrain rural enterprise and economic development (CLA, 1995 in the Times, 1995).

Realignment - Work ‘With’ Rather than ‘Against’ Nature

Whilst, what biologists and ecologists termed a ‘new paradigm’ was emerging in ecological restoration of streams and rivers, ‘retreat’ as a response strategy was emerging in the coastal literature as a key concept in “*geomorphologically sustainable management*” in the face of rising sea levels (Bray *et al*, 1997; Green and Penning-Rowsell, 1999; Turner *et al*, 1998). ‘Retreat’ defined at the “*planned abandonment of land and structures in vulnerable areas*” through new legislation, government policy and planning regulations to prevent future and relocate present development (Bray *et al*, 1997) and predated similar discussion yet to arrive on fluvial floodplains. The concept had evoked strong opposition from the public and in local politics, the term was re coined ‘realignment’ to help diffuse tension, but setback compensation schemes were not available to implement such policies (*ibid*).

In addition to coastal work, Geomorphologists had been striving for recognition as a contributing discipline to river management for many years, arguing that their discipline had a real and valuable role to play in modern practices, but to date geomorphologists

had remained marginalized from any practical involvement in river management, instead adopting a more passive role in which they “*subjected real world policies, practices and solutions to 'critical science' from the sidelines*” (Downs and Thorne, 1996, p455). The increasing concern for the environment, a turn to ‘sustainable’ policy and changes in planning legislation strengthened the position of geomorphologists and led to the recognition of the need for their greater active involvement in river management (*ibid*). Research, studies and assessments by geomorphologists supplied information on the form and physical processes operating in fluvial system, with the aim of providing valuable information to “*river engineers and managers wishing to work with, rather than against, nature*” (Thorne et al, 1996, p469). They suggested “*modifications*” to management policies, engineering and maintenance operations that would “*avoid destroying*” and instead “*seek to retain and enhance the natural forms and features of the river*” and, thereby, promote environmental restoration of aquatic and riparian habitats (*ibid*). However, although there was a gradual increase in the number of geomorphologists being employed by authorities charged with river management (Brookes 1995 in Downs and Thorne, 1996), the involvement of fluvial geomorphologists in river projects remained limited. Downs and Thorne (1996), as geomorphologists, thought this was due, in part, to the lack of a rigorous and repeatable methodology for geomorphological studies.

Realignment - Work ‘With’ Rather than ‘Against’ the Structure

Floodplain restoration from both ecologists and geomorphologists was seen to demand more than “*enthusiastic and effective advocacy*”, the discourse relied heavily on asserting the cost-effectiveness and ‘win-win’ scenario of restoration projects, using the government’s drive for economic efficiency and value for money in public agencies to achieve the conventional goal of flood defence (Adams *et al.*, 2004). The success of a “*restoration champion*” depended on “*their ability to persuade the flood defence engineers whose budgets they need to carry out their work*” (Adams *et al.*, 2004). Adams *et al.* (2004) describe Anne Crabbé’s definition of institutionalism in environmental policy (chapter 3, section 3.2), as engineers were accused to “*continue with what they know best*”, the challenge by those working within the EA was seen as overcoming “*the inertia of established ways of operating*” and a “*lifetime of stopping flooding colours engineers’ attitudes, even where other actors are willing to innovate*” (*ibid*). The need for geomorphological assessment was ‘*sold*’ on the fact that alternative designs and regimes would result in more successful solutions to river instability problems, generally cheaper post-project maintenance and fewer undesirable

side effects and destabilizing impacts elsewhere in the fluvial system (Thorne *et al.*, 1996). From the interviewee data in Adams *et al.* (2004), ecologists were also seen to be expressing the potential benefits of restoration in terms of flood defence, to unlock considerable investment from the flood defence budget, that “*dwarfs everything else*” (Adams *et al.*, 2004, p1937). Yet at this time the flow was still in the direction of achieving ecological objectives, “*not only improving riparian or in-stream habitat, but also increasing the flood storage capacity of the floodplain and helping prevent serious flooding downstream*” (*ibid*, p1937) and not vice versa, ecological schemes led by flood alleviation objectives.

Some engineers did start to talk in terms of rehabilitation, whereas previously they were not willing to discuss restoration schemes, although draft restoration project proposals that included criticism of past flood control work were often dismissed as “*purely anecdotal*”, despite the recognition in wider circles that excessively efficient drainage channels could increase the flashy nature of river flows, leading to big peaks in the flood hydrograph (*ibid*, p1937). A critical concern remained “*rivers getting out of control*” and the “*worry about vegetation*”, particularly trees on floodplains. Ecologists saw the worry of vegetation holding back flood flows as a benefit, extra storage capacity for downstream floods; “*if you talk to flood defence engineers about capacity they talk about flows. If you talk about flows they talk about capacity. You can't win*” (Adams *et al.*, 2004, p1938). As such, where ecologists did manage to influence engineers and their budgets, floodplain (and river) restoration projects were “*extremely modest*” (*ibid*).

5.5 Planning and the ‘Triple Bottom Line’ of Sustainability

Planning and local government had survived the onslaught of the 1980s, with the Conservative Secretary of State for the Environment, John Gummer (Department of the Environment, 1994), placing an emphasis on ‘quality’ in town and country planning (Davies, 1998). With the work of development corporations, enterprise zones, the City Challenge and so forth, planning had become far more responsive to market forces and planners had learnt how to operate a plan-led system in a market economy (Davies, 1998). The private sector now took the lead role in deciding the kinds and amounts of development required and undertaking their implementation. Increased central control over local government finance, reducing from 77% in 1947/48 to 17% in 1998 (Chartered Institute of Public Finance and Accountancy, 1996), reduced the capacity of

local authorities to undertake the implementation of their own development plans (*ibid*). Planning authorities were increasingly reliant on “*bargaining with the private sector for planning gain and community benefit in the course of determining an application for planning permission*” (Davies, 1998, p149). Specific national policy guidelines (PPGs) led to increased central government control over development plans, in addition to development control decisions continuing to be overturned on appeal (Davies, 1998).

The powerful sustainability rhetoric of the Bruntland Report, to strike a balance between economic, social and environmental goals, the ‘triple bottom line’ (Elkington, 1999), was also fully embraced in planning circles. The Government, in the face of global warming, had published its first thoughts in a White Paper, “This Common Inheritance: Britain's Environmental Strategy” (Department of the Environment, 1990). The Department of the Environment began to revise Planning Policy Guidance notes (issued in 1988 on main areas of policy including green belts, town centres, housing etc.) to take into account sustainable development, the concept became widely accepted as the guiding principle in the review of planning authorities’ structure and local plans (Davoudi, 2012; Illett, 1994; Unsworth, 2007).

The Rain in Britain Does Not Fall Mainly on the Plain

In February 1995, Professor Dennis Parker of the Flood Hazard Research Centre, Middlesex University, wrote to the Times to detail how urban development and investment was still progressing at a rapid rate in flood-prone areas (The Times, 1995). From the planner’s perspective, Illett (1994) stated that his experience in dealing with water-related issues within the planning system had “*not proved to be rewarding*”. At the structure plan level (county), he had rarely read representations from the water industry, feeling strategic advice on aquifer protection and the suitability of catchment areas to receive further development would “*assist in preventing confrontation at later stages in the planning system*” (Illett, 1994). Illett also demonstrated the planner’s alternative perspective, or dilemma, “*it must be recognised that there are issues other than drainage which relate to sustainability, and which must be allowed to dominate*”. By expanding existing towns to minimise the need to travel and achieving economies of scale to make public transport and social facilities viable, he believed that it was “*not sensible simply to decant development to locations which are convenient in drainage terms alone. No one ever set up a factory or bought a house because the drainage systems could be made to operate conveniently. Technical issues which are capable of*

resolution must not be allowed to frustrate good planning practice". Illett also saw "too many organisations at work, and the boundaries to their responsibilities are unclear....the organisations themselves are unclear as to their powers and responsibilities". He also noted Planning authorities were also wedded to traditional (non-sustainable) systems which would facilitate new development, rather than facing delays to introduce new sustainable practices, with heavy cost implications to the developer, to leave the planning authority "exposed to appeals elsewhere" (Illett, pxiii).

Heavy rains swept England and Wales in March 1997, the Thames in London rose 8ft above its normal level, major rivers in England burst their banks. About 300,000 hectares of land were under water, the Minister of Agriculture told the House of Commons that it was a *"disaster of the first magnitude"* (The Times, 1997). Again, the storm of 1947 was used as a reference point as *"scientists"* warned the widespread destruction caused by the floods of 1947 *"would be dwarfed by the devastation of a similar event today"* (The Times, 1997). Immediately in March 1997 planning guidelines were announced to reduce development in vulnerable areas along rivers, on floodplains and in coastal areas. Geoff Mance, Director of Water Management at the Agency stated *"in recent years, as the extent and rate of development has increased, the true risks have come to be recognised. Current uncertainties over climate change and associated sea-level rise make the need to safeguard floodplain areas all the more important"* (ibid). Both climate change and a further 4.4 million homes that were expected to be built in the future were said to be of concern. Rachel Kelly of the Times, in her launch of her battle to save the British countryside, viewed the proposed increase of *"new Noddy boxes"*, as the latest government forecast for new homes raised from 4.4 million to 5 million; *"if so many of the new houses in the area are meant to be starter homes, why are so many built with four and five bedrooms?"* (The Times, 1998b). The Environment Agency detailed housing at risk on the flood plains of England and Wales covered about 1,000 square kilometres, more than two million homes in the South East alone were under threat from flooding, because many low-lying areas had been used for housing. In the Times; *"millions more houses are to be built. Just as they attracted the Mesopotamians, flood plains allure today's developers, who look on lush empty fields, in the middle of towns, close to rivers, as ideal new housing estates. If current building trends continue, the number of people living on flood plains will increase by the equivalent of a city the size of Bristol by 2016..... Above all, man needs to acknowledge that his best efforts at managing nature can backfire"* (The Times, 1998c). The President of the British Hydrological Society,

Frank Law, however did not believe it was right of the Times' correspondent to place all the blame for buildings on flood plains upon developers of new housing estates; "*many local councils have found it only too tempting to grant themselves planning permission for schools, old people's homes and social housing on cheap, low-lying land that was bound to flood in due course*" (The Times, 1998c). With the recent (October 1996) publishing of the first digital map of the flood plains of England and Wales by the Institute of Hydrology, research commissioned by MAFF, Law believed it enabled "*those concerned to understand better the vagaries of British rivers*" (*ibid*).

'Man's Arrogant Disregard of the Delicate Balance of Nature'

The end of 2000, October, "*floods swept through the market towns of the South East, hundreds of people were caught unawares, their houses engulfed by a tide of swirling brown water. The flooding is the worst for decades*" (The Times, 2000). November 2000, "*once again the rivers are at breaking point, towns are under water and the elderly are ferried to the safety of makeshift shelters while torrents of brown, polluted water swirl through their homes*" (The Times, 2000b). October 2001, "*the Army was on standby last night to help with mass evacuations after the worst floods for more than 20 years swamped Cambridgeshire and Essex*" and "*thousands of householders were preparing to flee or try to stem surging floodwaters with sandbags as rain again moved into the region*" (The Times, 2001d). John Prescott, the Deputy Prime Minister of the Labour Government, declared the 2000 floods "*a wake up call for everyone*" (Moss, 2007).

Following the flooding episodes the Times Newspaper reported "*houses close to rivers or with fine views over flat, low land often command premium prices. Nothing could be stupider or more likely to lead to trouble. Flood plains are nature's way of controlling rivers that burst their banks. They are the huge overflow areas where acres of water can drain slowly into the ground.....Attempts to regulate rivers have also made things worse. Many have been narrowed with concrete embankments, constricting and accelerating the flow; those that meandered have been straightened, making them run even faster when they are swollen. Some rivers have been diverted through town centres, others hemmed in by roads, embankments and gravel pits.....Time and time again this foolish engineering has led to disaster..... Yet half the 90,000 British planning applications each year are for building on land at risk of flooding. As the Environment Agency now suggests, they should be routinely refused*" (The Times, 2000b). The Director General of the Wildlife Trusts, Simon Lyster, stated that one of the key factors which had made the effects of the floods much worse has been the loss of natural wetlands in our flood plains; wetlands "*are brilliantly effective at absorbing*

water at times of heavy rain and releasing it slowly into rivers like a giant sponge". He called on the Government to encourage wetland restoration on flood plains instead of building on flood plains, subsidising intensive agriculture and relying on hard engineering for flood protection; *"work with nature, not against it"* (The Times, 2000d). The Chief Executive of the World Wildlife Fund (WWF), Robert Napier, reiterated wetland restoration and also stressed the Government should act swiftly on EU legislation, the Water Framework Directive; *"Until we have a strategic framework which manages whole river basins rather than individual rivers and streams the UK will continue to be racked by the effects of floods, droughts and water quality problems"* (The Times, 2001a). The WWF launched their new report, 'Turning the Tide on Flooding' in 2003. The media also quoted Prince Charles, that the floods were the consequence of *"man's arrogant disregard of the delicate balance of nature"* (The Times, 2000b).

The former principal solicitor for the Environment Agency, Eversheds, also drew attention to the fact the construction of flood defences could damage the environment; *"there was always a feeling that there was an internal conflict at the Environment Agency between its role in relation to the protection of the environment and in terms of flood defence"*. He believed that in the future public bodies, such as the Environment Agency and local government planning authorities, *"could be held responsible for making a difficult situation far worse through a string of poor decisions - often against scientific advice - during the past decade"* (The Times, 2000c). It was thought the floods would bring matters to a head and *"trigger a review of the roles of these public bodies"*. Local planning authorities were also blamed *"the fault lies not in the heavens but in local council chambers that we are inundated"* (The Times, 2000b). The Times also noted that responsibility for flood defences was confused, with numerous bodies involved, including the Environment Agency, county councils, district councils; *"but none has a specific duty"* (The Times, 2000b).

More Flood Defences and Stricter Planning Guidelines

Following the 2000 floods, the Government announced a further £51 million for local flood defences and introduced stricter rules to prevent development on land at risk of flooding. Planning Policy Guidance (PPG) 25 (DETR, 2000) was the government's *"most recent attempt to deter development in flood plain areas via the planning process"* (Brown and Damery, 2002). Sir John Harman, chairman of the Environment Agency stated in England and Wales, nearly 10 per cent of the existing housing stock was at risk from

flooding, and the planning system provided the greatest opportunity to make sustainable choices for development in the future. The Agency was to class areas at risk from flooding as either 'functional flood plains' or 'high risk'. New development could be allowed after "*strict scrutiny*", but the developer would be deemed responsible for the cost of maintaining flood defences for the life of the property (The Times, 2001a).

In 2001 media reports claimed 'house builders' had almost doubled the number of homes they were developing in flood zones in a year, rising from 13,700 to 22,800, about one sixth of all house building (The Times, 2001f). Elliot Morley, the Flood and Coastal Defence Minister stated that in "*scores of cases, councils ignore the objections of the Environment Agency, which is responsible for flood warnings, and allow developments in areas at risk*" (*ibid*). The Times (2001) detailed 100 houses to be built by Westbury Homes on the site of 'Wetmore' Hall and where the Agency had objected to the development because parts of the site fall within a flood plain. The Local Government Association's planning policy officer, said they were working to improve the relationship between its members and the agency; "*we would not advise local authorities to go against the agency's opinion.....Instead, local authorities should be pushing the provision of better flood defences way up the political agenda*" (*ibid*). The Times (2001b) asked planners why houses were built on land that was likely to flood, after more flood prone residents in Hampshire were evacuated from their homes: "*we were eager to provide affordable housing for local people. House prices around here are high and we are always looking for ways to help people on low incomes. We have to make exceptions to our policies to get a low-cost site, then you get a lowish cost house. We would not have given planning permission for market sale housing on this site because it's outside the village and in a location where we wouldn't normally want the village to grow*". Brown and Dannery (2002) considered PPG 25 had only "*been successful in exposing the risks of indiscriminate land-use planning*".

In 2000 the Association of British Insurers (ABI) had given the Government two years to provide adequate flood defences before insurance company members started excluding areas of high risk from cover (The Times, 2002c). Over the next two years, the ABI lobbied the Government, demanding a review of flood defences and urgent action, warning thousands of homes could be blacklisted unless the Government spent substantially more and made firm decisions to improve flood management strategy including a review of planning controls over building in flood risk areas (The Times, 2001b; 2001e; 2002a; 2002c). With the increasing concern about the economic costs of

extreme weather events, many insurance companies were looking to introduce differential pricing, thought to eventually result in ‘red-lining’ for those located in extremely high risk areas (ABI 2001; Crichton 2001 in Brown and Damery, 2002). The estate agents Savills, warned that without an insurer, householders may lose as much as half their value (The Times, 2002c). July 2002, the Government promised to accelerate the programme of building flood and coastal defences in response to growing concern about the impact of global warming, increasing spending on the defences by £150 million by 2005 (The Times, 2002d).

BSE Tipping Point for New Institutional Arrangements

After several years of policy arrangement stability, development on floodplains supported by more flood defences, the policy context of flood risk management was to shift significantly. MAFF was replaced (or encompassed) in 2001, allegedly due to the BSE crisis, by the Department for Agriculture, Food and Rural Affairs (DEFRA), responsible for the policy framework, strategic guidance and legislation for flood management and water resources in England. Commentators questioned whether the change of name and structure would affect basic ideologies and methods (Robertson, 2001 in Adams *et al.*, 2004), although in the opinion of Scrase (2006), the widespread flooding together with the demise of MAFF had created a context in which profound changes in the sector appeared more likely than at any time since the 1980s. The past practices of flood defence were declared no longer tenable or affordable, calls were made for a ‘more strategic, integrated approach’ to managing floods across a whole catchment (Blackwell & Maltby, 2004; Ledoux *et al* 2005; Moss and Monstadt, 2008). *“In the context of these pressures, and with the possibility of a greater frequency and severity of flood events in the future, it has become increasingly apparent that the institutional and legislative arrangements for managing flood risk in the UK require reform”* (Brown and Damery, 2002). Further legislation from the EU was also about to favour a change in arrangements.

5.6 The Water Framework Directive and Making Space for Water

At the turn of the century, the Global Water Partnership gave greater prominence to Integrated Water Resource Management (IWRM), further defining the need for co-ordination of land and water and the ‘trinity’ of sustainability; *“a process which promotes the*

coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP, 2000, p22). This definition was seen to create challenges, in particular how the planning of water and land-based systems were to be integrated at an operational and institutional level, considering the “*predisposition of resource-based agencies not to connect with other organizations with shared interests and overlapping responsibilities*” (Mitchell, 2005). As a result, much attention arose in the development of effective institutional arrangements to overcome the fragmented nature of water policy to support IWRM (Kidd and Shaw, 2007), including the Water Framework Directive (2000/60/EC).

The Water Framework Directive

Water quality standards were based on a long tradition, the origins of European community water policy were back in 1975, with the establishment of drinking water abstraction standards (Howe and White, 2002; Novotny, 2010). The European legislative influence increased over the next 25 years to encompass bathing water, nitrates and urban wastewater treatment (Howe and White, 2002). But as water policy increased, it was also seen to become increasingly fragmented, and there was the growing recognition of the need for an integrated strategy that incorporated water quality, pollution and ‘quantity’ issues (King, 1996 in Howe and White, 2002). The Water Framework Directive was established in December 2000, marking “*an important institutional policy milestone by institutionalizing ecosystem objectives as the prime objective for other policy areas and decisions*” (Howe and White, 2002). The community’s historical record with water management was considered to have been consistently stronger than legislation at a national level (Howarth, 1992 in Howe and White, 2002) and the need to comply with the latest legislation was viewed as bringing about a rise in importance of environmental issues (Howe and White, 2002). The WFD’s primary aim was to improve and manage the quality of water, however the Directive also sought to control the quantity of surface and ground waters, to deal with hydromorphological pressures and to protect aquatic ecosystems and wetlands (*ibid*). For new developments, there was a need firstly to prevent deterioration of ‘status’ in a water body, but where this is not possible, mitigation measures should be applied. Where a physical modification had already taken place, actions should first be considered to restore the water body with the aim to achieve ‘good ecological status’ (restoration). Where restoration was not possible, mitigation measures should be investigated with the aim to meet ‘good ecological

potential'. The WFD set ambitious environmental objectives and stated other policies must also take into account water management objectives in order to increase synergies and reduce antagonisms (WFD Art. 4(3)-4(7)). The formation of 'River Basin Management Plans' were the main tool, taking water management beyond a local perspective to the given basin (Howe and White, 2002; Wiering, 2006).

Foresight Future Flooding Project and Urban Development

The floods that affected the country at the turn of the century prompted the relationship between land use (urban and rural) and flooding to be explored in the 2004 Foresight Future Flooding project (Evans *et al.*, 2004). The report, authored by engineers, employed quantitative, probabilistic, computer analysis using "very large" Geographical Information System (GIS) databases based on the Risk Assessment for System Planning (RASP) system developed by the Environment Agency. The report stated that if current flood-management policies remained unchanged, the risk of flooding and coastal erosion would increase greatly over the next 30 to 100 years, the number of people in England at high risk from flooding might increase from 1.4 million to between 2.0 million and 3.3 million and the expected annual economic damages to properties might increase from £0.9 billion to between £1.5 and £20 billion.

The report also concluded that urban development illustrated "*some of the most obvious effects of land use change on water management*" (Wheater and Evans, 2009, p259). As "*vegetated soils are replaced with impermeable surfaces, increasing overland flow and reducing infiltration, bypassing the natural storage and attenuation of the subsurface*", in addition, "*overland runoff is conventionally collected by piped storm-water drainage systems and conveyed rapidly to the nearest stream*", the result, "*a greater volume of runoff, discharging in a shorter time, potentially leading to dramatically increased flood peaks, but also reduced low flows and less groundwater recharge*" (Wheater and Evans, 2009, p259). It was also noted that "*over the past century or more*", floodplains have been increasingly used for development, and the need to protect that development has led to engineered disconnection of the river from its floodplain. The result is a loss of flood attenuation, and increases in flood risk (Wheater and Evans, 2009). Evans *et al.*, 2004 reflected that many major towns and cities were adjacent to rivers, and there were continuing economic pressures to build in river floodplains. The report drew attention to the need to balance the wider economic, environmental and social needs for land use, especially the demand for new housing, against creating a

legacy of flood risk. Yet, the report noted the balance between state and market forces in decisions on land use needed to be managed; *“floodplains have precisely the function that their name suggests; rivers can be expected naturally to flow beyond their banks every few years. The natural functioning of a floodplain is to store and subsequently release floodwaters, attenuating a flood as it travels downstream* (Wheater and Evans, 2009, p259).

The Future Flooding analyses showed that with a *“sustainable”* portfolio of *“structural and non-structural responses”*, the future risks could be pulled back to a level around that of the present day. In the top twelve responses, land use ranked alongside engineering responses as the most powerful in controlling future flood risk, yet the *possibility of having to find the space through our riverside towns and cities to accommodate flood flows up to 40 per cent greater than today’s values presents great challenges not only in engineering terms but particularly to urban planning. It contrasts awkwardly with Government policy of reusing brownfield sites* (ibid). It was believed to be controversial to ban redevelopment of brownfield sites that lay in the floodplain, but that are behind well-managed flood defences affording a high standard of protection (which applied to much of London). Instead, the report called for more sharply targeted policy instruments to affect future urban flood risk including, renewal of existing urban spaces, new urban forms, new densities of development, more green space and encroachment into green belts.

Making Space for Water

The aim of the 2004 Foresight Future Flooding project was to use the best available science to provide a challenging vision for flood and coastal defence in the UK between 2030 and 2100 and so inform long-term policy. On 29 July 2004, in the wake of the Foresight Future Flooding Report (2004), Defra launched their ‘Making Space for Water’ consultation exercise. On 16 August 2004, *“exceptionally intense and prolonged storm conditions centred over the North Cornwall coast and the headwaters of Bodmin Moor”* (Fen et al., 2005). The storm generated, now infamous, extreme flooding in the coastal village of Boscastle. The media immediately declared *“Boscastle today, Prescott’s concrete Britain tomorrow”* and wondered would happen to *“those 250,000 ‘Prescott homes’ that are currently planned for the lowlands? Brownfield sites? Many are more likely to become mud-coloured puddles. Today we can sympathise with the people of Boscastle who have suffered at the hands of a mainly natural disaster. Tomorrow we could be witnessing flooding entirely of our own making”* (The Times, 2004).

The Government received 268 formal responses to the consultation exercise from a wide variety of stakeholder organisations, companies and individuals. In London, October 2004, CIWEM (Chartered Institute for Water and Environmental Management) conference delegates and strategy consultees met with sponsors RSPB, Noel Cleary (Head of Flood Management Strategy Unit, Defra), David Rooke (Head of Flood Risk Management, EA) and David Richardson (Deputy Chief Engineer, Flood Management, Defra). Under the conference's introductory line, "*the Strategy for Flood and Coastal Defence was last published in 1993 and now needs revising*", presentations included Noel Cleary accompanied by Edmund Penning-Rowsell, Middlesex University, assessing and managing flood and coastal erosion risks in the context of sustainable development. David Collins (Defra) joined Ruth Davies of the RSPB to focus on making space for water by working with natural processes, managed realignment, the role of washlands and catchment-based land management approaches to achieve multiple objectives. (In the land use planning session, Noel Cleary, Head of Flood Management Strategy Unit, Defra joined Lester Hicks, ODPM to focus on planning and development policy, urban drainage, sewer flooding and groundwater flooding).

As Moss and Monstadt (2008) summarised, the network of ideas and body of research from ecologists, biologists, hydrologists and geomorphologists influenced water management thinking in England. The new strategy 'Making Space for Water' (2005) set out the government's 20-year plan for a holistic approach to fluvial flood and coastal erosion risk management, to embrace the new flood doctrine and seek a different model of flood risk management than that which had preceded it (Johnson *et al*, 2007)). It was recognised that a more holistic approach to the management of rivers and floodplains was required, moving away from managing risks on a project-by-project basis towards a catchment approach achieving multi-functional benefits where possible. The results of the strategy were anticipated in the form of more soft engineering approaches, land-use planning, and flood risk management solutions that worked with natural processes (Defra, 2005). For the later, more space was to be made in the environment through, for example, appropriate use of realignment to widen river corridors and areas of multi-functional wetlands that also would provide a wildlife and recreational resource (Defra, 2005). Making Space for Water also sought more transparent and accountable decision processes to allow for longer term risk drivers such as climate change, urbanisation, increasing wealth and social factors (Johnson *et al*, 2007). The overriding objective was

to reduce the threat to people and their properties and to deliver “*the greatest environmental, social and economic benefit, consistent with the Government’s sustainable development principles*” (Defra 2005). Furthermore, flood and coastal erosion risk management was to be embedded across a range of Government policies and thereby policy implementation opened up to a wider range of stakeholders, including rural development, agriculture, nature conservation and most notably, planning and urban development (Defra, 2005).

5.7 Planning and the ‘Light’ Green Paper

As Defra undertook strategic reforms in flood risk management, planning in England witnessed a series of fundamental and complex reforms, as the election of the New Labour government in 1997 “*unleashed a rhetoric of modernisation*” in the renewal of both public institutions and policy areas, in order to improve both ‘effectiveness’ and ‘efficiency’ (Cowell and Owens, 2006; Tewdwr-Jones, 2008). Planning had formed an integral part of the Department of the Environment (DoE) from the department’s establishment in 1970. In 1997 planning was absorbed into the Department of the Environment, Transport and the Regions (DETR). Notably, it was during this period that connections between planning and sustainable development were first developed (Cowell and Owens, 2006); the role of the planning system in achieving sustainable development was emphasised by government guidance as “*meeting the needs of a growing and competitive economy, providing for new development, such as housing and in protecting the natural and built environment*” (Department of the Environment, 1997, p1). From 1997, the core responsibilities for environment and sustainability were taken over by the Department for Environment, Food and Rural Affairs (DEFRA), whilst planning was relocated in the Department of Transport, Local Government and the Regions (DTLR). It was from within this department that the new Labour Government initiated their review of planning and questions were immediately raised about the effects of planning on the competitiveness of the UK economy (McKinsey Global Institute, 1998 in Cowell and Owens, 2006). The McKinsey Institute’s report in 1998 linked the capacity of local authorities to deliver planning for business with economic growth, rejecting a role for public planning (McKinsey Institute, 1998). In the second term of the Blair Government, December 2001, the publication of the Planning Green Paper pronounced a radical overhaul of the tools of planning. (In 2002 the Transport

portfolio became a standalone department, and the remainder were renamed the Office of the Deputy Prime Minister (ODPM).)

A ‘Culture Change’ for Planning

The Government had been committed to ‘do something’ about planning due to business concerns and criticism about continued over-regulation, the lack of speed and efficiency of the system (Inch, 2009; Tewdr-Jones, 2008). Planning commentators had begun to debate the culture of planning, which over many years it was stated the system has been perceived as marginalised and essentially a regulatory activity, reactive and defensive, often portrayed as the problem rather than the solution (Durning & Glasson, 2004 in Shaw, 2006). It was decided a ‘*culture change*’ was required to promote planning as a positive tool (ODPM, 2002). The New Labour government described ‘spatial planning’ as an opportunity for planners to take on a more proactive and dynamic role, placing them in a central position in relation to a range of high profile policy agendas and new forms of local governance (Tewdr-Jones, 2008, p359). The renewed spatial planning practice, in playing the integrating role, met Labour’s discursive commitments to joined up government, collaborative community engagement to shape sustainable futures (Inch, 2010). Thus, in addition to addressing business concerns, spatial planning could “*go beyond*” the performance of the statutory planning system, playing an expanded, strategic and more proactive role in integrating public policy; “*Spatial planning goes beyond traditional land use planning to bring together and integrate policies for the development and use of land with other policies and programmes which influence the nature of places and how they can function....They should deal not only with what can be built where and in what circumstances, but should set out also how social, economic and environmental objectives will be achieved through plan policies*” (DCLG, 2006, p12).

The Planning and Compulsory Purchase Act (2004)

The legislation for the planning reform proposals, the Planning and Compulsory Purchase Bill, went to Parliament in 2002 and received Royal Assent in May 2004. The Act introduced tightened deadlines to speed up planning decisions, clarifying national guidance and reducing the volume and complexity of guidance and increasing flexibility and discretion in decision making for fast moving business sectors, such as hi-tech (Cowell and Owens, 2006). A new tiered system of statutory plans, regional spatial strategies (RSSs) and local development frameworks (LDFs) replaced county level

structure plans and district level local plans (in existence since the late 1960s), with a formal requirement for vertical integration between the two (ODPM 2004; 2005a in Kidd and Shaw, 2007). Connections were also to be made with key national strategies including the Sustainable Communities Plan, the Government's reconstituted housing policy (ODPM 2005b). The central conclusion of the Treasury-commissioned 'Barker report into housing' recommended a major new house building programme along with reform of the planning system to make it easier to build new developments, including on greenfield sites (HM Treasury, 2005 in Hall, 2011). Hall (2011) considered Kate Barker's logic was that house price inflation could be countered by systematic and planned house building. Planning Policy Guidance Notes were replaced with Planning Policy Statements; Regional Planning Guidance Notes with Regional Spatial Strategies and Sub-Regional Strategies were introduced for the first time. Planning Policy Statement 1, Delivering Sustainable Development, reiterated that sustainable development was the core principle underpinning planning (ODPM, 2005); drawing on the Bruntland Report (1987), the Statement included "*at the heart of sustainable development is the simple idea of ensuring a better quality of life for everyone, now and for future generations*" (p2).

Planners – Finding Space for Water

Defra's 'Making Space for Water' (2005) had emphasised the importance of a coordinated approach to land use, planning policy and urban design. Kidd and Shaw (2007) believed embedded in the Government's aspiration for sustainable development "*are – or should be – development and management concerns associated with water*" (p320). Although water related concerns were spread though national guidance, Planning Policy Statement 25 (PPS25) replaced Planning Policy Guidance 25 in 2006 to outline the roles and responsibilities for developers, regional and local planning bodies and authorities, in a more strategic, rigorous and systematic approach to the development decision-making process regarding flood risk (Goodson, 2011; Johnson *et al*, 2007). Strategic, regional and site level flood risk assessments (FRAs) were the tool for coordinating effective planning for sustainable development. Amendments to article 10 of the Town and Country Planning (General Development Procedure) Order 1995, meant planning authorities had a statutory duty to consult the EA on all development in areas at risk of flooding (except 'minor development') fluvial or coastal flood risk areas and on any development exceeding one hectare (Goodson, 2011). If the EA objected, but the LPA

remained minded to approve an application for major³ development, then under the Town and Country Planning (Flooding) (England) Direction 2007, the Secretary of State was provided the opportunity to check the application's general compliance with the policies in PPS25, and call it in for determination if appropriate (Communities and Local Government, 2006, p9). The PPS did include an 'exceptions test' in areas liable to flooding where some continuing development could be considered necessary for wider sustainability reasons and to avoid social and economic blight (Johnson *et al*, 2007). A floodplain development delivering a surplus of benefits over costs would be permitted, for example, in the recent decision to develop the Thames Gateway floodplains for housing, having taken wider social and economic regeneration factors into account (Johnson *et al*, 2007).

Under the ethos of "*working in constructive partnership*", under PPS25 all stakeholders were to identify "*opportunities for development of infrastructure that offer[ed] wider sustainability benefits*". This included the dual use of flood storage and recreation to realise "*cost effective*" solutions for the reduction and management of flood risk. Opportunities offered by new development were to be taken, making the most of the benefits of green infrastructure for flood storage, conveyance and sustainable urban drainage systems, and tucked away in the guidance; "*re-creating functional floodplain; and setting back defences [to] reduce the causes and impacts of flooding*" (*ibid*, p2). PPS25 placed an emphasis upon 'reducing', in addition to 'avoiding' flood risk. At the turn of the century, the urban environment and regeneration had become a coherent planning concept following the publication of influential reports and strategic documents, including the Urban Task Force Report 'Towards an Urban Renaissance (Urban Task Force 1999), the Sustainable Communities programme (ODPM 2003) and various Campaign for Architecture and the Built Environment (CABE) documents. In the 1999 report from Lord Rogers and the Urban Task Force, with the mission of a "*new vision for urban regeneration founded on the principles of design excellence, social well-being and environmental responsibility*" (p1), there were two brief statements concerning 'water' (relating to waste water and pollution). Flooding and climate change issues were absent from the report. Following the

³ Major development defined in The Town and Country Planning (Flooding) (England) Direction 2007 as: (a) in respect of residential development, a development where the number of dwellings to be provided is 10 or more, or the site area is 0.5 hectares or more; or (b) in respect of non-residential development, a development where the new floorspace to be provided is 1,000 square metres or more, or the site area is 1 hectare or more.

introduction of the Sustainable Communities plan (2003), by its own admission, the government failed to consult adequately on “*availability and provision*” of water and wastewater services (Water UK, 2005). The ‘Value of Design; the Value of Public Space’ was funded by CABI Space in 2001-2003, the resulting short report containing one passing reference to water, “*In the towns of Emmen, Appeldoorn and Leiden in the Netherlands, it has been shown that a garden bordering water can increase the price of a house by 11 per cent, while a view of water or having a lake nearby can boost the price by 10 per cent and 7 per cent respectively*”.

The Environment Agency had felt it appropriate to consider how flood risk management activities could achieve “*wins for regeneration*” as Making Space for Water had suggested (Defra 2005, p21). Defra also commissioned a report by Claire Twigger-Ross (2005) for embedding flood risk management policies within the urban policy field, through the development of a wider range of solutions that were designed not only to alleviate flooding but also to provide well-designed spaces with a range of benefits, including biodiversity and recreation (Twigger-Ross, 2005). CABI Space had been established in 2003 to put urban and green spaces at the heart of the urban renewal agenda. The change in approach to ‘living with flooding’ was seen by Twigger-Ross as a unique opportunity to engage with the urban green space agenda. She saw both agendas as “*differently calling for the development of green space within urban areas and that synergy should be recognised*” (Twigger-Ross, 2005, p13). “*A way in for the Environment Agency*” was seen to be via sustainability appraisal and Strategic Environmental Assessment (SEA), the EA being a statutory consultee at the scoping stage, which meant an opportunity for influence at an early stage of the LDF (Twigger-Ross, 2005).

To date, floodplain restoration was in the main a flood alleviation solution to be used in rural areas, its application in urban areas had been limited “*because of differing priorities about what to protect and how the human environment might be affected*” (Shih and Nicholls, 2007, p1527). Kidd and Shaw (2007) saw part of the solution to the development of effective strategic integration as lying with effective “*operational integration*” of spatial planning and IWRM activities, noting the criticism that planning authorities had received over recent years. As ‘sustainability’ in flood management was becoming an explicit policy goal (as indeed in planning), The Environment Partnership, ‘TEP’, believed opportunities existed to better understand the potential merits of realignment in urban areas (TEP,

2002). Back on the Thames, activities undertaken by the Thames Region EA documented the on-going difficulties in achieving 'operational integration' between planners and water managers in the urban arena.

Urban Managed Realignment – Back on the Thames

In 2003, the floodplain of the Thames Estuary was now home to 1.25 million people, with £181 billion (62% nationally) of property at risk from tidal flooding (EA, 2003 in Shih and Nicholls, 2007). The historic trend of encroachment into the Thames had left the river channel approximately half its original width and four metres deeper. This increased flow during periods of high tide and further increased flood risk (LBHF, 2002 in Shih and Nicholls, 2007). The Thames Gateway initiative proposed a further £11 billion liability of 120,000 new homes over the next two decades (Shih and Nicholls, 2007). 'Hard' engineering schemes, including the Thames Barrier, were "*ubiquitous*", extensively upgraded and expanded since the floods of 1953 (Gilbert and Horner, 1984; Shih and Nicholls, 2007, p1527). The progressive upgrading of defences, with higher and steeper walls, had caused concern about the Thames estuary's degraded habitats and obstructed public riverside amenities (Shih and Nicholls, 2007). Yet the existing flood defence works were approaching or had reached the end of their design life, and allowing for climate change the impacts of flooding were considered likely to become more extreme if "*additional measures or upgrades*" were not taken (*ibid*). The indicative figure to maintain the defences to an appropriate standard throughout the 21st century was £14 billion (EA, 2003). To address nature conservation and riverside development concerns alongside flood risk management, the flood defence program had been evaluated to '*encourage*' long-term innovative flood management options to complement the existing defence system (Shih and Nicholls, 2007). This included 'managed realignment' to move defences back from their current position to one further inland. Unlike in rural areas, habitat creation was "*not the main driver*", only achieved when the land use conditions were suitable (*ibid*, p1528). Instead, other benefits as well as improving flood protection and flood storage, were to connect people to the river through improved riverside access, to change public perception about the significance and value of the river environment and to reverse the historic trend of encroachment onto the tidal Thames floodplain (*ibid*).

The desire to implement schemes was deemed to be present, the issues were understood, but ‘spatial planning’ was required to play a key role in determining the appropriate sites. As realignment required large areas to create a significant amount of flood storage, proposed schemes competed with the space required for urban development. The second term of the Labour Government had also been marked by a concentration in policy terms on urban and neighbourhood regeneration, urban and regional growth (Tewdwr-Jones, 2008). A flurry of reports, white papers and planning statements (Urban Task Force report (DETR, 1999); Urban White Paper (DETR, 2000)) prioritised the redevelopment of sites and reuse of redundant buildings, promoting mixed-use, medium-density development around transport hubs to improve the quality and viability of the urban realm and the quality and vitality of urban life, also meeting the need for the increasing numbers of one and two-person households (Unsworth, 2007).

Unsworth (2007) detailed a water manager’s perspective on spatial planners; that they perceived flood defence as an unrelated issue to sustainable development and as a result, planning guidance had not considered the requirements of sustainable flood defence alongside those for land use development. It was claimed this division stemmed from the “*unilateral, short-term planning and the lack of coordination*” between DEFRA and the Department of Transport, Local Government, and the Regions (DTLR), who considered themselves as “*mutually exclusive*” to each other. Both ministries had developed policies that were only relevant to their own departmental remit, DEFRA considering itself as responsible for managing national flood and coastal defence whilst the DTLR viewed itself as responsible for delivery of a sustainable pattern of land use promoted by an ‘efficient’ planning system. DEFRA’s national flood defence policies, including high-level targets, guided the development of realignment schemes, “*but with no clear direction on implementation at the ground level*”. This resulted in the implementation of realignment schemes as “*difficult and problematic*”. As such it was the poor integration of national flood and coastal defence policy with the local spatial planning process, “*poor planning*”, and the lack of a strategic approach for selecting sites that “*most hindered*” the potential for widespread realignment along the Thames (Cooper *et al.*, 2002; Lavery and Donavan, 2005; Leafe *et al.*, 1998; Shih and Nicholls, 2007, p1529). Furthermore, political scepticism was seen to hinder the progress of urban realignment, “*the government preferring to avoid capital schemes that are not for the sole purpose of coastal and flood defence while*

saving cost on 'questionable' projects". This meant habitat conservation and riverside enhancement had been perceived as issues under the responsibility of other government bodies, not necessarily linked to flood defence. English Nature saw traditional plans *"produced by people deeply entrenched in the traditional hard engineering culture"*, whilst plans that advocated realignment were often *"diluted by local flood defence committees wanting to maintain the status quo"* (Collins, 2002). As such implementation comprised of mainly *ad hoc* demonstration projects. Thames Region EA was widely considered a lead authority on innovative approaches to urban flood risk management. In 2007, they considered better integration of flood risk and planning policies were still necessary to give urban realignment appropriate consideration alongside other land uses. Shih and Nicholls (2007) believed more scientific research and education on realignment was needed to *"attenuate political scepticism"*, whilst growing recognition that *"holding the line"* could not be sustained indefinitely, made realignment an increasingly important option in the future.

June 2007, *"Severe weather warnings have been issued for many parts of Britain as thunderstorms and torrential rain are expected to bring flooding"* (The Times, 2007a). *"Given the amount of wet stuff falling from the sky, it might be thought appropriate that Gordon Brown has spent the summer talking about ways to build more homes. Mr Brown, aided and abetted by Yvette Cooper.....appreciates that the risk of flooding and housing policy are best dealt with as separate issues. The Times Newspaper now declaring the "Government cannot countenance any needless distractions if it is to hit its target of building three million homes over the next 13 years. The threat posed by floodwaters is a problem that needs attention, but it is not a reason to dilute the development"* (The Times, 2007b). Referring to the new movie, 'Flood', that submerged London, the Times also asked *"if London faced a New Orleans-type flood, how would we cope? For a nation that grinds to a halt when a sprinkling of snow lands on railways tracks, such a storm surge disaster hardly bears thinking about. There is no time to lose to start planning the next generation of flood defences -how many more warnings do we need?"* (The Times, 2007c).

5.8 Summary Analysis

The preceding chapter, 4, traced the persistency of contesting voices to land drainage and engineered flood defences in the half century from the land drainage act of 1930 to the 1980s. We know from the introductory chapter of the thesis, that by 2004, these voices had gained a policy foothold in Defra's new strategic approach 'Making Space for

Water'. The main research question for chapter 5 was what these claims were exactly, where these claims came from, and how they came to be successfully recognised in policy circles. A 'giant milling mass of discourse' has been disentangled, encompassing water management and planning policy, and water managers and planners actions on floodplains from the 1980s to the summer floods of 2007.

Battle Lines – Discourse Coalitions

In the early 1990s, the discourse of environmentalism and 'sustainability' mobilised in response to a strongly pro-development agenda. The language of sustainability provided the frame for contesting voices to express the benefits of floodplain restoration, as opposed to the environmental impact of the engineering approach to floodplain policy. Aided by the environmental movement, the discourse on floodplain restoration slowly emerged and gained momentum, initially through a concern for a 'revision' or 'mitigation' of damaging engineering practices, through to full conservation and restoration. The flood plain controversy now involves many different actors, each with their own interests and ideologies, yet the shift from 'flood defence' to 'floodplain restoration' is mirrored by two radically opposed perceptions of reality, to 'control nature' or to 'live with nature'. Critical Discourse Analysis aims to identify the 'knowledges' that are contained in discourses and directs the researcher to ascertain what disciplinary stocks of knowledge are drawn upon. One of the most pertinent findings from chapter 5, is the battle lines between discourse coalitions are broadly drawn on disciplinary lines. Ecologists and geomorphologists versus civil engineers. The traditional camp is supported in their approach by the insurance industry, land and property owners, the house builders federation. The opposing camp includes actors from the NGOs (e.g. World Wildlife Fund, Wildlife Trusts, Royal Society for the Protection of Birds) and the conservation and fisheries staff within the EAEW responsible for EU directives. The Government appears split, broadly down departmental lines, whilst planners are in 'no man's land'.

Shock Flood Events

The major, frequent flooding events at the turn of the century can be characterised as shock events, at which cuts have been taken in the discourse strand. These flood events are recalled in successive government reports and have received heavy media coverage. Chapter 4, pre 1990s, saw the media supporting the flood defence discourse, utilising

war language to provoke a government response. In the late 90s the folly of building on floodplains gained a dominant position in the discursive space of the media and maintained the prominent position until 2004, with the launch of 'Making Space for Water'. Whilst NGO bodies began to campaign on the issue of the loss of habitats in rivers and wetlands, journalists were also drawn repeatedly to images of 'dying' rivers, correspondents repeatedly drew attention to planning decisions that permitted development on floodplains (particularly if that development had subsequently flooded) and also considered the significance of 'natural' floodplains in mediating the floods. Whether or not an event becomes a 'discursive event' and influences the flood policy discourse usually only happens if an event appears on the discourse planes of politics and the media, extensively and for a prolonged period of time (Jager and Meier, 2009). If a statement occurs very frequently it has sustained effects and strongly solidifies a particular knowledge and becomes a stimulus for change (*ibid*). Whilst the Environment Agency complained they could not maintain the flood defences, and persisted that sensible land use planning was the solution, the Government remained in denial for the need for a strong change in approach. Despite the media's support of naturally functioning floodplains, the knee jerk reaction of the Government after events, pressured by the insurance industry, has been repeatedly to increase flood defence funding (and cut funding as the media spotlight faded). Finally, after the softening up by the media, it was the rational 'hard' science, the 'RASP' of the engineers authoring the Foresight Report that gave credibility to the claims that the current approach was inadequate in the face of the strong exogenous force of climate change. Aided and abetted by the storm clouds that gathered over Boscastle, 'contesting voices' of the opposition camp found their window to influence the radical change in policy, from flood defence to flood risk management in Defra's 'Making Space for Water' (2004; 2005).

It is actors who are relatively new to the policy scene that have influenced the rewriting of policy; hence in practice they co-exist with traditional colleagues. This means ecologists and geomorphologists are by no means autonomous in the practice of floodplain restoration, the flood defence discourse-coalition can still rely upon many well-institutionalised practices. To date new 'rules of the game' have not been widely translated into practice. 'Flood Defence Committees', born in the 1930s, despite fundamental restructuring in central government departments including the demise of

their long term parent MAFF, have retained executive powers within the EAEW to 2007. The power and resources are thus retained by engineers, in addition the beliefs of the opposing disciplines are discredited by engineers, they are burdened by the need for proof that floodplain restoration ‘works’. To date only EU Directive policy, in the guise of the Strategic Environmental Assessment Directive (2001/42/EC), Habitats Directive and the Water Framework Directive, provide levers to implement ‘working with nature’ ideology, and to provide safeguards to certain habitats and species. Appeals to ‘cost-effectiveness’ and more economic working practices draw upon the new public management discourse, to result in small, piecemeal schemes.

The Control Paradox

Changes within the flood risk management policy arrangement can clearly be linked to broader structural changes in international society; ‘shifts in governance’. The ‘ecological turn’ in water management and floodplain restoration have been affected by international calls for integrated water resource management and by the wider concepts of sustainability, which “percolated through government departments” following the Earth Summit in 1992 (Adams *et al.*, p1934). Multi-sector, multi-level trends have been driven by international concepts on integrated water resource management. As well as standing for sustainable water management, IWRM also sought to challenge the lack of co-ordination and ‘silo’ mentality within the water sector and with neighbouring policy domains, including spatial planning. However, sustainability includes a strong pillar of ‘economics’, incorporating core concepts of new public management. The discourse analysis has revealed the symbiosis between engineering ideologies (favouring structural flood defences), the belief of insurers that a well-defended (structural defences) flood plain development can be insured, together with the government’s knee jerk reaction to fund flood defences after shock events, mutually reinforces development on floodplains. In other words, if the traditional institutional arrangements persist, then the government’s course of affairs is furthered – economic growth. Whilst media pathos played to the floodplain restoration discourse, to date the dominant (hegemonic) view is that although floodplain development should be restricted, there can be a strong economic and social view for affordable housing in areas where the area is protected by adequate flood defences. You could be forgiven for surmising that successive Planning and Housing Minister’s have played lip service to restricting development on the floodplain, whilst leaving the back door ajar (or sometimes blatantly open) to the

development industry and on-going encroachment. Dutch researchers characterise the focus on reinforcing flood defences (dikes) as an answer to any new water challenge as the 'control paradox' (Remmelzwaal and Vroon, 2000 in Wiering, 2006). As they explain, the flood defence creates a feeling of safety and thus encourages a more intensive land use behind the dikes. If a flooding incident then occurs, people are less prepared and the damage can be greater. This then creates an urgent situation and the knee jerk reaction to raise and/or reinforce the flood defences again, which leads to a new feeling of safety and leads to further land use development with even greater risks and so on and so forth (Remmelzwaan and Vroon, 2000; Van Stokkom et al., 2005; Wiering and Immink, forthcoming in Wiering, 2006). When these flood defences fail, then planners are blamed by all parties, including the government who impose the horns of a dilemma. If planners do not permit development, they are thus perceived as an impediment to economic growth.

Planners – An Impossible Balancing Act

The fact that the planning directorate is no longer located within the environment ministry is apparent, the adjacent policy fields of planning and floodplain restoration contradict each other and prove difficult to integrate. Planning 'stagnates' floodplain restoration policy in urban areas. National planning policy statements are definitive in their commitment to sustainable development, yet planners struggle to operationalise sustainable decisions on floodplain development with the government's commitment not just to economic growth, but to high rates of economic growth. The principles of sustainable development articulated in government policy "*have been criticised for being too weak and for being implemented too slowly because of the belief that economic growth should still drive policy decisions*" (Kelly et al., 2004). Kelly believes two different perspectives of planning co-existed within Government: spatial planning with a concern for a broader more strategic and sustainable role for planning, whilst the other perspective concerned a focus on land values and enhanced development opportunities. The government states it is committed to creating sustainable communities, yet is "*equally uncompromising in its attachment to an anthropocentric interpretation of weak sustainability*" (Kelly et al., 2004). Owens and Cowell, 2006 also saw the major fault line in the planning arena, "*between conceptions of sustainability that emphasise development within environmental limits, and those that seek to balance different objectives*".

Penning Rowsell *et al.* in 1996 pointed out that the implementation of non-structural solutions as a response to flooding was a “*more complex process institutionally than are structural, or engineered, flood-alleviation measures*” (p86). As non-structural strategies almost invariably depend for their implementation on more than one institution, as with water managers and land-use planners, it means that the context of one institution’s decisions, policies, and actions includes its partners’ institutions and their characteristics (p86). As Moss and Monstadt stated in 2008, as previous policy arrangements had favoured the use of rivers’ floodplains for agriculture, settlements and engineered flood defences to protect that investment now lying vulnerable on the floodplain, the successful implementation of the new discourse of floodplain restoration would involve agreement between many interests that had contributed to the loss of floodplains in the past and call for complex institutional reforms in various policy fields and societal domains. To what extent can the normative ideals for floodplain restoration, set out in Making Space for Water, be implemented in urban areas, considering the battle scene on floodplains in 2007? We now turn to chapter 6 and the subsequent five years of field research investigating change or stability in the flooding policy arrangement. Contesting voices have been constrained by the power and rules of the game of engineers, but have used the wider structures to their own ends, namely EU legislation in the form of the Habitats Directive, Environmental Assessment and the Water Framework Directive. The latter, the WFD, is mainly involved with water quality, which is proving a more ‘sustainable’ sector. In late 2007, the EU Directive 2007/60/EC on the assessment and management of flood risks was about to enter into force on 26 November 2007 and the Pitt Review would deliver its verdict on the cause and consequences of the summer 2007 floods. Have the floods given the counter-discourse coalition the window of opportunity to cross the power threshold, and translate floodplain restoration into mainstream practice?

6

After the 2007 Floods: a Bedding Down or Ebbing Away of the Novel Discourse

*When, having left his Mountains, to the Towers
Of Cockermouth that beauteous River came,
Behind my Father's House he pass'd, close by,
Along the margin of our Terrace Walk.
He was a Playmate whom we dearly lov'd.*

From 'The Prelude' by William Wordsworth (1805)

Contesting voices, belonging to geographers, ecologists and planners, have intermittently punctuated the hegemonic flood defence discourse in the half century from the 'pivotal point' in institutional arrangements, the Land Drainage Act 1930. The dynamics of the new discourse will be examined in order to see if concepts have been accepted and taken up in practice to bring about institutional innovations in flood risk management. Chapter 6 commences the empirical stage of the research, from 2007 to September 2012. (As described in chapter 2 (p44), primary data is coded by year, sequence of transcript in the year and actor, the codes linking to the relevant section of the case study data base.) The focus will be on the activities of the actors on the urban floodplain, how they construct the policy problems and thereby their solutions, to assess how far they have progressed to address flood risk management in an integrated and sustainable manner by 2012. Section 6.1 traces the rise of the new emblematic environmental issue; climate change. The findings of the Pitt Review are considered in section 6.2. Two important forces for change, the EU Water Framework Directive and Climate Change are addressed in sections 6.3 and 6.4, before the implications of the 'financial crisis' are considered in section 6.5. Finally, the National Planning Policy Framework and its implications are outlined. Chapter 6 answers research question 3 of the research, has the window of opportunity been taken following the shock event of the Summer Floods of 2007?

6.1 Climate Futures

Flood, *Miami Beached*, *Holland 2.0 Depolderized*, part of a recent raft of books and films that contemplated the geographic implications of the future; ‘climate change’ was the ‘emblematic’ environmental issue at the beginning of the new century. In the UK, Labour Prime Minister Tony Blair declared climate change as “*probably the greatest long-term challenge facing the human race*” (Blair, 2006). The Fourth Assessment Report (AR4) published by the United Nations International Panel on Climatic Change (IPCC) (2007), outlined the challenges human beings were facing due to the effects of global climatic changes (Novotny *et al.*, 2010). Climate change was predicted to increase the magnitude and frequency of large and catastrophic storms, resulting in more frequent flooding. The newly released film *Flood*, in which London was “*swamped by a tidal surge*”, grasped the media’s imagination; “*with uncertainty about the effects of global warming, it is a worrying scenario for the capital*” (*The Times*, 2007c). As one book critic commented, “*perverse, disastrous climate change scenarios actually offer certain societal forces a sense of future relief—however misguided or short-term that relief may be*” (Manaugh, 2010). In *Flood*, London is saved by one of the film’s heros, by activating the Thames barrier’s submerged controls (before drowning). Back in England’s capital, reality mirrored fiction, as “*from her office overlooking the Thames Barrier.... Rachael Hill, technical strategy manager at the Environment Agency’s Thames Estuary 2100 project, [was] working to ensure that scenes of a submerged London are confined to disaster movies*” (*ibid*). With 1.25 million people now living in the Thames Estuary flood plain, with assets valued at over £80 billion, Hill stated, “*Without the Thames Barrier and other flood defences, low-lying parts of the Thames Estuary, including parts of London, would be at risk of flooding twice a day with the rise and fall of the tides, and also from North Sea surges four or five times a year*”.



Figure 6.1: ‘London as Venice’ by Robert Graves and Didier Madoc-Jones, based on a photo by Jason Hawkes. From the London Futures exhibition, Museum of London (2010)

Source: www.postcardsfromthefuture.co.uk

A Timely Reminder

The IPCC released their fourth report in March 2007 (as detailed above), revealing the first firm evidence “*for the hand of global warming in changing rainfall patterns*” (Carrington, 2007). In the ensuing June to August period the river basins of England experienced record rainfall, leading to conditions not witnessed since records had begun in 1766 (Marsh, 2008; The Times, 2007e). In the most severely affected areas of the lower Severn Basin and the headwater tributaries of the Thames floodplain inundations were both wide-spread and protracted (Marsh, 2008). In Yorkshire and Humberside, rainfall exceeded 300% of average, resulting in the most extensive flood episodes of the 20th century (*ibid*). The sustained high flows had a serious impact in urban areas where the limited potential for floodwaters to drain away left communities stricken, including Doncaster, Sheffield and Tewkesbury. River flows were extreme, although a significant feature of the 2007 floods was the surface water flooding; two-thirds of properties affected were inundated by overwhelmed drains and sewers, including 8000 homes in low-lying Hull (*ibid*). In total, 7000 businesses and 48,000 homes were flooded in the South West, the Midlands, Yorkshire and Humberside, with 120,000 household insurance claims, 27,000 commercial claims and a £3bn overall cost to insurers, “*the largest single claims event in British history... in the worst floods for centuries*” (The Times, 2007e). As Marsh (2008) concluded, “*whilst the magnitude of major fluvial floods does not appear to have increased through the twentieth century, vulnerability to the associated flooding clearly has. Continuing floodplain development and urban growth has contributed to the rapidly rising economic and social costs of notable flood events*” (p279).

David Balmforth (engineer/MWH/CIWEM) wrote to the Times (2007d), stating the summer’s floods were a “*timely reminder of the dangers of adopting a ‘wait and see’ approach to climate-change adaptation*”. Balmforth (as co-author) referred back to the 2004 Foresight Future Flooding report, to highlight “*in the future conventional approaches to flood defence would become unsustainable in terms of cost, disruption and environmental impact*” and it was “*important that the energy of the scientific and engineering community is directed towards developing sustainable solutions to future flood risk*”. Whilst calling for measures to make ‘new’ development “*more flood resilient*”, he noted that improving the “*flood resilience of existing urban communities will prove more challenging*”. Balmforth believed that “*in the more extreme cases, managed retreat may prove to be the only viable option*” although recognising that this had “*enormous social and economic implications that [would] require long and sensitive planning to implement*”. However, he

stressed; *“Doing nothing, while the debate on climate-change prediction rages, could see the devastation of recent months repeated on a regular basis. It is simply not an option”*. In Parliament, MPs were *“scathing about the performance of the Environment Agency. The Commons Public Accounts Committee said that despite a funding increase of 40 per cent, flood defences in England had not markedly improved”* (The Times, 2007c). The flood defence allocation was increased for 2010/11, up from £600 million to £800 million (*ibid*).

“The waters inundating swaths of central and western England are no reason to block urgently needed new homes, including developments built on flood plains, the housing minister said yesterday” (The Guardian, 2007). Yvette Cooper warned her critics not to *“play politics”* with the floods as the Government’s green paper on housing, ‘Homes for the future: more affordable, more sustainable’ was published, which promised £8bn of investment in affordable housing and explained how the government would build 3m more homes by 2020 (*ibid*). Cooper warned that *“without action housing could become one of the greatest sources of social inequality”* (The Guardian, 2007). In the Telegraph (2007b), the Conservative Party voiced concern that *“the Government’s proposals would lead to further flooding and misery in the years to come”*, Grant Shapps, the Shadow housing minister, in Parliament told MPs; *“We can expect more flash floods of the type we have experienced in recent days and weeks. Labour aren’t planning the eco-towns of the 21st century, they are planning the sink estates of tomorrow”*. The Labour government had accepted the 2005 Barker report, commissioned by the Treasury (section 5.7) and along with a fundamental reform of the planning system, had committed itself to a target of 120,000 new homes per year by 2016 (Houghton, 2008 in Hall, 2011). In 2007 Communities Secretary, Ruth Kelly, announced the creation of a single agency responsible for housing and regeneration in England, ‘the Homes and Communities Agency’⁴ combining elements of the former Housing Corporation and English Partnerships with functions of Communities and Local Government to include regeneration programmes, provision of affordable housing, housing market renewal and supporting growth and urban renewal in key areas, including the Thames Gateway (Inside Housing, 2008). The Board was named in 2008, to include Kate Barker. More homes were to be backed by *“more ambitious building targets, increased investment, and new ways of identifying and using land for development”*. More social housing was to ensure that *“a decent home at an affordable price [was] for the many, not the few”* and homes were to be built *“more quickly –by unblocking the planning system and releasing land for development”* (Direct Gov, 2007).

⁴ Initially named ‘Communities England’ in the announcements by Ruth Kelly.

Online Editor of the New Scientist, Damian Carrington (2007), joined the academic debate on the “*wisdom or otherwise of building on flood plains*”. Whilst noting “*Flood plains are flat and conveniently located for many urban areas, but they are flood plains, which come under water when rivers periodically break their banks*”, he found the point from Ian Cluckie interesting: “*Ten per cent of UK housing is on flood plains, but this is quite low compared to some countries, it is 70% in Japan and 100% in the Netherlands*. Cluckie’s (Department of Civil Engineering, University of Bristol) solution; “*We need better flood defences*”. Justin Taberham (Director of Policy, Chartered Institution of Water and Environmental Management), thought it “*significant and thought provoking*” that a year ago in the drought of 2006, “*we were seeking ways to retain water. Now we are desperate for it to go out to the sea. What we need is a more holistic approach that recognises the role of catchments in terms of flood storage*”.

Allegedly “*keen to be seen to act in the immediate aftermath*” Labour Prime Minister, Gordon Brown, appointed the country’s first ‘Minister for Flood Recovery’ in July 2007, John Healey. Healey (former Parliamentary Private Secretary to Gordon Brown as Chancellor of the Exchequer (1999-2001) and Economic Secretary (2002-05) (Parliamentary Record, 2012)) was given the task of cleaning up after the UK’s worst floods for centuries. One year on Healey reported the 2007 floods were a one in 200-year, “*but freak weather does occur, and less often here than in some countries. Flooding is a major hazard of climate change*” (*The Times*, 2008c). When asked if the Government could have been better prepared, the Minister replied “*we do have to improve defences. That is one of the really sharp lessons from last summer, that we hadn’t given enough attention to the prevention and preparation*”. When the correspondent enquired, “*flood defences are clearly crucial, but planning is an equal, if not more important factor. The Government wants three million new homes by 2020. Where will they build them?*” Healey responded “*the history of Britain is that we do build on flood plains. The question is: can you do so without ... unreasonable risk? There will be pressure because we badly need so many new homes in Britain*”. In reflecting upon PPS25, whereby ministers could intervene with planning applications in areas prone to flooding; the Times correspondent reflected, “*it seems to fall far short of a blanket ban on building on flood plains*”.

Unsaleable, Uninsurable and Uninhabitable Homes on Our Concreted Land

Sir Michael Pitt’s interim report on the independent review of the Summer 2007 was published in December 2007 and “*made it clear that Britain was not as well prepared as it should have been*” and made it plain that planning controls in flood risk areas were not

applied rigorously enough (The Times, 2007e). In a Press Release the Association of British Insurers (ABI) stated “*of the three million new homes the Government plan to be built by 2020, a third will be on the floodplain*” (ABI, 2008). Justin Jacobs, the ABI’s Assistant Director of Property had been speaking at the Architects Journal conference and warned: “*The Government’s ambitious housing plans are in jeopardy unless we reduce the flood risk. In the last year 13 major developments have been given the go ahead despite Environment Agency advice on the flood risk*”. The ABI pressed the Government, that “*where a local authority plans to ignore flood risk advice, the Government should step in and review the proposals and be compelled to publish their decision. Insurers want to continue to provide flood cover, but poor planning decisions will lead to more homes becoming unsaleable, uninsurable and uninhabitable.*”

Following the Summer Floods and the Interim Pitt Review, a number of reports ensued to address institutional arrangements, with a particular focus on surface water management. July 2008, and Defra’s long-term strategy for the overall water sector in England and Wales, ‘Future Water’ was out for consultation. The strategy developed further earlier strategic statements on flood risk management (from ‘Making Space for Water’; Defra 2005) for securing a sustainable approach to water management and to find a balance between “*people and nature*”. As “*surface water run-off [had] affected two thirds of the 55,000 homes flooded last summer*” (Defra, 2008), the Times (2008b) was concerned for William Blake “*turning in his grave*” as England’s “*green and pleasant land*” was “*in danger of being buried under a sea of concrete as householders pave[d] over their front gardens to create off-street parking*”. In a repetition of language from the 1990s, but incorporating the new terminology of surface water flooding, the newspaper reported the view of Nick Reeves, executive director of the Chartered Institution of Water and Environmental Management; “*one of the lessons learnt is that we must be smarter in the way that we use land. It is no longer acceptable to concrete over our gardens and green spaces when we know that open space is nature’s sustainable drainage system and has a vital role in helping to prevent flooding*” (The Times, 2008d). Future Water proposed householders should require planning permission to pave their front gardens, unless permeable materials were used; “*impermeable materials such as concrete and tarmac prevent rain from soaking into the soil, thereby encouraging run-off into gutters and drains and increasing the risk of flash floods*” (*ibid*). Amendments to the permitted development rights were introduced in October 2008, householders who wished to “*pave over their front garden with an impermeable surface must apply for planning permission, however, those wishing to use permeable surfaces do not*” (Ciria, 2009).

Future Water recognised that no regulatory authority as yet had an overarching responsibility for sustainable urban drainage systems, ‘SuDs’. The Environment, Food and Rural Affairs (EFRA) Select Committee inquiry on ‘Flooding’ (House of Commons 2008) and Defra’s consultation document both considered new structures and the need for amended institutional and legislative arrangements (Ellis and Revitt, 2010). The Government announced in June 2008 that local authorities would be taking the lead responsibility for surface water management and the concurrent production of surface water management plans (SWMPs), in accordance with the recommendations from Pitt (2008) and the EFRA Select Committee (House of Commons 2008). The Environment Agency retained the strategic policy overview and direction for both flood risk and pollution control, including the production of catchment flood management plans (CFMPs) and river basin management plans (RBMPs), under the EU Water Framework Directive (WFD) regulations (Ellis and Revitt, 2010). In addition, the Department of Communities and Local Government (DCLG) published their ‘Practice Guide’ for the implementation of PPS25 Development and Flood Risk (DCLG 2008). The PPS 25 Practice Guide placed greater emphasis on surface water management, SuDs and their improved integration within the planning system. Alastair Dale (Regional Director of Capita Symonds) hoped that the Final Pitt Review would identify the importance of overcoming the *“inertia of existing practices”* and establish a new framework where responsibilities, process and actions were clearly identified, to enable the delivery of adaptation strategies that ensured the *“future sustainability”* of communities; *“Business as usual simply won’t be a safe option”* (The Times, 2008a).

6.2 Planning ‘in the Pitts’

The Final Pitt Review was published in June 2008 (Pitt, 2008), in the accompanying press release Pitt stated; *“Research published as part of my report today shows that the risk of flooding continues to escalate; making the events that shattered so many communities last year an ever increasing threat. I urge the Government to show leadership and urgently set out the process and timescale for improving resilience in the UK. The recommendations in my report are realistic and affordable and should be made a priority. Waiting for another serious event is a dangerous ‘strategy of luck’; we need to act now to protect our future.”* The Review revealed that around 10 per cent of properties in England were *now* located on the floodplain, with 11 per cent of new homes in England built in flood hazard areas since 2000, 16,000 dwellings built in high

flood risk areas in 2006. Around a quarter of properties that had flooded in summer 2007 had been built in the last 25 years. This, Pitt stated, emphasised the vital importance of strong planning controls as the *“images of flooded developments during the summer of 2007 brought home vividly the importance of well-informed development control decisions”* (p61) and led to recommendations 7 and 8 (see table 6.1).

Table 6.1: Pitt Review Recommendations for Building and Planning

RECOMMENDATION 7: There should be a presumption against building in high flood risk areas, in accordance with PPS25, including giving consideration to all sources of flood risk, and ensuring that developers make a full contribution to the costs both of building and maintaining any necessary defences.

RECOMMENDATION 8: The operation and effectiveness of PPS25 and the Environment Agency’s powers to challenge development should be kept under review and strengthened if and when necessary.

From 2001 to 2008, Defra’s High Level Target 5 (HLT5) had set out the requirement for Local Planning Authorities (LPAs) to report on Development and Flood Risk in England, on *“how well LPAs had taken into account our [the Environment Agency] advice on flood risk”* (EA, 2012). The authorities that had not followed the advice of the EA were named in the report. The EA stated that with the implementation of PPS25 and the Flooding Direction the amount of development permitted against their concerns had *“greatly reduced”*. The HLT5 requirement was rescinded in 2008, replaced by an annual “Development and Flood Risk Report”, containing a *“less detailed version”* of the impact of the EA’s flood risk technical advice on planning decisions made by English local planning authorities. This report no longer identifies the performance of individual local authorities. The 2010/11 report details 10,890 planning applications were referred to the EA by LPAs for detailed consideration on flood risk grounds. The EA initially objected to 3,443 (32%) of these planning applications, and boast that their advice is *“generally taken into account”*. Where the EA had initially objected on flood risk grounds *“and where LPAs have advised us of the final outcome”*, over 97% of decisions were in line with the EA’s advice. It is notable however, that passing reference is made to the fact that in 2010/11, LPAs provided the EA with planning decision notices for 65% of all applications objected to on flood risk grounds. The outcome of more than one third of

applications to which the EA originally objected to, therefore, remained unreported. At the strategic level, a water management consultant had encountered several local planning authorities who had “*not realised*” strategic flood risk assessments were “*crucial to the evidence base and [were] being done after the core strategy*”, some authorities were “*parking flooding to deal with economic issues*” (D09/5, Consultant Engineer).

Working with Natural Approaches – The Burden of Proof

The review also noted that it was now “*widely accepted that flood risk cannot be managed by simply building ever bigger hard defences. Softer approaches, such as flood storage and land management, can offer more sustainable ways of managing the risk, and can complement and extend the lifetime of more traditional defences*” (p127). Most responses to the Review had supported measures being taken on a catchment-wide approach, forming part of a broader scope of measures. The National Trust had responded; “*Every parcel of land in a catchment, including that within major built developments, can make a contribution to reducing the probability and consequence of flooding, with the uplands and flood plains playing vital roles in retarding the flow of water and providing enhanced water storage at a landscape scale*” (p127). Although the majority of submissions to the Review were of the view that there was already a framework in place to consider working with natural processes – Catchment Flood Management Plans (CFMPs), the concern of some respondents was that they might not necessarily deliver this role as well as required; “*a system was not in place to actively encourage their further consideration against more traditional options*” (p127). The Environment Agency indicated they would use CFMPs, due for completion in 2008, to “*work together to identify appropriate sites, for example, wetland creation, restoration of natural course of rivers and green corridors, and the development of better incentives to deliver multiple benefits through flood management*” (p127). Noting that “*the construction of engineered flood plain storage [had] been common for decades*”, many submissions to the Review would have liked to see “*not only further encouragement of this more common technique but also other techniques such as restoring the natural functioning of rivers*” (p127). The Review stated that in common with all flood risk management solutions, there was “*a premium on technical assessment of the area and of the appropriateness of the measures proposed. While there may be potential benefits for downstream flood risk, the effects of rural land use measures require careful, site specific assessment*” (p127). It was also pointed out that the solutions would also need to “*demonstrate clearly that flood risk will indeed be mitigated*” (p127). If, in some instances, the principal benefits were environmental then the extent of flood risk management resources being diverted to such a scheme would “*need to be*

carefully weighed’ (p128). However, conversely where schemes delivered a range of benefits including clear flood risk mitigation, then the funding and appraisal system needed to be “*sufficiently flexible to weigh up the relative benefits and costs of different proposals*” (p128).

Whilst the Review focused primarily on rural land use solutions, links were made to spatial planning and urban situations; “*where there is a need to create flood storage in urban or rural areas, opportunities identified in CFMPs need to be linked with the appropriate spatial planning strategies. Planning Policy Statement 25 identifies active flood plains as a land-use category, making it easier to identify sites for flood storage*” (p128). The accompanying practice guide to PPS25 states; “*The use of lowlying ground in waterside areas for recreation, amenity and environmental purposes can provide the most effective management of flood conveyance and storage as well as providing connected green spaces with consequent social and environmental benefits*” (p128). Considered to be “*perhaps most in the spirit of the Government’s Making Space for Water*” was the proposals contained in the practice guide to “*seek to combine new development with measures to restore heavily-modified watercourses and their flood plains to a more natural state. Such measures can include removing culverts, restoring meanders and reconnecting river channels with areas of flood plain obstructed by artificial features. All of these measures can result in reductions in flood risk, as well as significant improvements in amenity, biodiversity and water quality*” (p128). Pitt recommended that local authorities and the Environment Agency needed to work with developers and other partners to ensure that “*these kinds of opportunities are explored*” and considered these developments would not only manage flood risk in a more sustainable way but also provide a more attractive place to live. These approaches, including setting back of defences alongside rivers or relocation of assets, were also considered by Pitt to be particularly important if some of the more extreme scenarios, from the Foresight update arose; “*such as much higher river flows*” (p128). Again, the Review’s respondents expressed concerns that progress on the delivery of more working with natural processes was “*too slow despite Government flood risk management policy supporting this approach in its strategy Making Space for Water*”. Some submissions felt that “*the current appraisal system favoured the construction of flood defence walls over softer engineering solutions*” (p129). Natural England noted that: “*until now, driven by simple cost-benefit calculations, the system has had a tendency to deliver traditional concrete defences almost exclusively*” (p129). The Royal Society for the Protection of Birds recommended that there was a “*strong case for over-hauling the appraisal and prioritisation framework so that operating Authorities focus on the cost effective delivery of strategic flood risk*

management plans through a whole range of measures rather than testing the cost benefit of individual warning or defence schemes” (p129). Pitt’s recommendation is detailed in table 6.2.

Table 6.2: Pitt Review Recommendation for Working with Natural Approaches

RECOMMENDATION 27: Defra, the Environment Agency and Natural England should work with partners to establish a programme through Catchment Flood Management *Plans* (and Shoreline Management Plans) to achieve greater working with natural processes.

The EFRA Select Committee also reflected that the Government was better at funding single outcomes from single sources of funding, *“even though many of the outcomes and funding sources are derived from the same government department, Defra”*. A group has since come together to implement recommendation 27, *“led by the Environment Agency, this group has helped to define how natural processes can manage flood risk. It is clear that natural processes can help to deliver flood and coastal risk management, but the question is how much it can contribute, what other public benefits can be delivered and how much it will cost compared with other approaches, such as using hard defences”* (C09/1, EA Geomorphologist).

The Times (2008d) welcomed the recommendations of the Pitt Report on last summer’s floods, *“there can be no backsliding on commitments to be better prepared in future.....And there must be no cherry-picking of the Pitt recommendations for quick political gain in the run-up to a general election. Pitt must be implemented in full with local authorities given the extra resources and skills they will need”*. It was believed that the real tragedy of the 2007 floods was that *“we have come to fear water when we should always celebrate it as a positive force for urban living, enhancing the environment, biodiversity and for giving the simple, but joyous and life-enhancing, pleasures of seeing it, hearing it and touching it”*.

6.3 The Water Framework Directive and Ecosystem Services

Hydromorphological Condition and Good Ecological Status

Increasingly the Water Framework Directive (2000/60/EC) (WFD) (European Commission, 2000) *“with its objectives of good ecological status”* was being seen as *the* most important driver and provider of the *“necessary legislative support”* for a variety of policies

and initiatives promoting integrated river basin management and flood risk management that sought to work with natural processes and deliver multiple benefits (England *et al.*, 2008; Mainstone and Holmes, 2010; Wharton and Gilvear, 2007; A08/1, EA Geomorphologist; B08/1, SEPA Geomorphologist; D08/1, Academic Geomorphologist). Geomorphologists turned their attention to demonstrating the importance of the physical habitat in determining the structure of freshwater ecosystems, and therefore the potential to deliver ecological improvements in rivers consistent with WFD targets (*ibid*). The primary sectors seen to be “*contributing to the risk of failure*” due to morphological alteration, were: agriculture and forestry; electricity, gas and water supply; transport, storage and communication (Wharton and Gilvear, 2007, p146) and, notably linked together, land drainage, land claim, flood defence and urbanisation (A08/1, EA Geomorphologist). Within all these sectors “*the biggest factors*” were “*channel straightening, culverting, impounding and cultivating or planting to the river banks*” (*ibid*). As part of a national evaluation of risks to achieving ‘Good Ecological Status’, the Environment Agency identified a total of 2263 water bodies at risk of failing due to morphological pressures, representing 53.8% of the total number and 62.9% by river length (excluding cross-boundary districts). In an economic analysis, measures to restore geomorphological processes and assist natural recovery (particularly through the removal of in-channel barriers) were identified as highly cost-effective compared with other river restoration measures (Defra, 2008 in Mainstone and Holmes, 2010). However, although seen “*as a cheap method of improving ecological status for the WFD*”, it was noted that the methods would “*rely on partners and stakeholders’ good will to implement as it’s not a matter of regulation or legislation*” (B08/1, SEPA Geomorphologist). An EA practitioner explained that a gap remained in their ability to deliver hydromorphological improvements, “*it is only done on an opportunistic basis, through voluntary means, there are no free standing powers*” (C09/1, Geomorphologist). The first phase of implementing measures under the Directive was to take place over 2009 to 2015, with hydromorphological restoration of rivers undertaken as resources allow, with priorities set on the basis of cost-effectiveness and the “*robustness of evidence that hydromorphological condition is affecting the achievement of Good Ecological Status*” (Mainstone and Holmes, 2010, p91).

From the perspective of the WFD, effective management meant an integrated approach to water quantity and quality impacts, i.e. flooding and pollution, which Wharton and Gilvear (2007) viewed to be linked with the physical structure of aquatic if ecological

targets were to be met. The Environment Agency (2007) were working towards the integration of Catchment Flood Management Plans (CFMPs) for catchments of high flood risk across England, under the umbrella of River Basin Management Plans (RBMPs), the latter a requirement of the WFD. The CFMPs were to establish local management policies for different to alleviate flood risk, this was seen to “*help to maximise the combined benefits of flood management and other water policies*” (Wharton and Gilvear, 2007, p148). This, the geomorphologists viewed as an “*important and exciting development*” to potentially unlock “*funding streams for more costly aspects of river restoration.....that should over time facilitate strategic, catchment-scale river restoration*” (Mainstone and Holmes, 2010, p92). It was also seen to be important to “*quantify*” both the “*environmental and financial benefits of washlands for flood defence*” (*ibid*). Defra (2004) had anticipated that the WFD would require some rivers to be returned to a more natural state, including improving the river channel profile and river margins through setting back defences (in Wharton and Gilvear, 2007). However, they referred to areas of agricultural land currently behind potentially non-viable flood defences as the possible candidate areas for restoration and realignment, through the use of agri-environment schemes (*ibid*). It was also seen as “*critical*” that the flood pulse was “*recognised as a vital part of most river ecosystems*”, the ecological disturbance producing a burst of biological productivity, maintenance of biodiversity and fertility of floodplain soils (Allen, 1993; Vervuren et al., 2003 in Wharton and Gilvear, 2007, p148).

Differing Perspectives Within the Restoration Discourse Coalition

The morphological and ecological components of a river system were seen to be closely interlinked; channel form, system functioning and therefore species composition was the result of interacting processes (Wharton and Gilvear, 2007). The technical complexity to the ‘restoration’ debate, with the many components of physical habitat in rivers, at different scales and a wide range of physical modifications to consider, a “*plethora*” of potential techniques, created an additional hurdle to agreement between different groups (Mainstone and Holmes, 2010, p89). Interestingly there was a “*surprisingly diverse range of perspectives*” apparent amongst freshwater ecologists and biologists. There was also a lack of consensus between academic and applied ecologists about “*robust evidence on the ecological benefits*” on how far accumulated research knowledge could be used to support decisions in practical restoration (*ibid*) and “*big data gaps and big gaps in understanding*” and “*problems with communication, between academics and agencies in*

particular” (D08/1, Academic Geomorphologist). Fluvial geomorphologists looked to adopt a larger-scale, process-based, approach to restoration under the “*usually un-tested*” philosophy of ‘assisted natural recovery’, whereby the restored habitat would be colonised biologically (*ibid*). ‘Fishery-led’ restoration managers were “*generally positive about the concept of larger-scale restoration planning but the lengthy delays in putting such planning in place lead to understandable frustration and a desire to ‘get on with something in their own patch’*” (*ibid*). This tended to lead to a more pragmatic, but less considered, modification of in-channel features in short sections of river, with “*little consideration of larger-scale constraints on channel morphology, the biodiversity of the riparian zone, or lateral hydrological connectivity with floodplains*” (*ibid*). The conservatism of engineers (detailed in section 5.3), restricting ‘soft’ engineering elements to new capital works, and reducing channel maintenance activity where there was no risk to people and the built environment, Mainstone and Holmes (2010) believed was eroding under the building political pressure, including Pitt (2008), “*to incorporate more flood risk schemes involving river restoration and floodplain storage*” (Pitt, 2008). England *et al.* (2008) also quoted the River Restoration Centre’s view that there was a large increase in the number of *river* restoration schemes undertaken in recent years in England, with the many drivers available; Defra’s ‘Making space for water’; Higher Level Stewardship (part of an agri-environment scheme introduced in England in 2005), now the Water Framework Directive. Mainstone and Holmes (2010) saw a range of conservative and progressive perspectives within the operational community of flood risk managers, whereby attitudes towards more “*fundamental restoration*” was more positive in situations where there was an “*existing flood risk problem for an urban area that might be mitigated by greater upstream out-of-bank flooding in areas with no population*”. This they saw, “*should generate an increasingly favourable attitude over time*” (p89).

Whilst the main restoration debate and activity centred in rural areas, the ‘Sustainable Development of Urban Rivers and Floodplains (SMURF) project, funded by the European Union (EU) Life programme, did however aim to develop and disseminate a methodology for improved land-use planning and water management in *urban* floodplains, consistent with the EU Water Framework Directive (Petts, 2007). The Tame, specifically the stretch within the City of Birmingham, was considered a typical urban river, affected by at least 300 years of urban and industrial growth, water quality and quantity remained problems with stretches of the river “*in a poor ecological state, having low amenity value, affected by pollution flushes and facing development pressures along the important*

floodplain” (*ibid*). The project provided a new and ‘rare’ discussion of how people learn through deliberative processes, drawing upon an empirical analysis of a novel public engagement process for urban river restoration; “*social issues are usually addressed ‘downstream’ of the science*” (*ibid*, p303). Although noting development and planning were going “*to be critical in the future*”, water management practitioners, policy makers and academics noted the absence of planners in professional networks, “*Local authorities are notable by their absence, they can’t see anything in it for themselves, they are not excited by it*” (J09/3, Academic Engineer/Hydrologist).

Standing on the Shoulders of Natural Systems – Ecosystem Services

The Water Framework Directive, Habitats Directive and ‘Making Space for Water’ were seen to be encouraging a re-appraisal of land management, including “*the use of lowland rural floodplains to temporarily store flood water in order to avoid the flooding of urban properties and infrastructure elsewhere in the catchment*” (Posthumus *et al.*, 2010). Posthumus *et al.* (2010) (including notable figures, Joe Morris and Tim Hess of Cranfield University) reported in the journal of ‘Ecological Economics’, the use of the ecosystem approach to represent the variety of services provided by floodplains, to satisfy the interests of a range of stakeholders: including “*land managers, flood management agencies, conservation organisations, local communities and society as a whole*”. It was hoped that the integrated ecosystems approach could help inform future policy and practice for floodplain management, “*hopefully in ways that appeal to key stakeholders*”, although noted that the global food shortages in 2007 with “*associated high and volatile agricultural commodity prices have put food security and agricultural production back on the political agenda*”.

The growing ecosystem service research agenda had been driven by several major global initiatives: The World Bank (2004), conservation programmes by the World Wildlife Fund, The Nature Conservancy, and Conservation International, together with the Millennium Ecosystem Assessment (2005) (Fisher *et al.*, 2007). In a paper emanating from a ‘Valuing Wild Nature’ workshop (University of East Anglia, 12-16 March 2006), sponsored by the Royal Society for the Protection of Birds, Natural England and Defra the UK Government's Department for Environment, Food and Rural Affairs, the authors noted that integrating economic and ecological sciences into an operational decision support system, ‘ecosystem services’, was seen to be a “*key step for global conservation and sustainability*” (*ibid*, p2052). “*Couching*” ecosystem service research within

economic theory gave “one way to move to a more structured engagement between biophysical science, social science and policy” (*ibid*). The authors were keen to stress that the resulting arguments for conserving nature to ensure their continued delivery were “*in addition to, not in place of, ethical and scientific ones*”. The Millennium Ecosystem Assessment (2005) defines ecosystem services as “*the benefits people obtain from ecosystems*”. As economics was essentially seen as the study of how humanity provides for itself, and “*humanity largely provides for itself by standing on the shoulders of natural systems*”, therefore, an “*economic framework for ecosystem service research*” seemed logical (*ibid*, p2052). The Millennium Ecosystem Assessment highlighted how the ecological integrity of our world was rapidly changing, which would certainly affect human welfare. Our “*collective ability to manage these changes*” was seen to face the obstacles of gaps in our ecological knowledge, shortcomings in our economic approaches and flaws in our decision support systems and policy responses (*ibid*). The authors called for future research in the field, to include an understanding as to where on the “*ecosystem service provision continuum we currently stand, so that we can inform policy on which tradeoffs society can and cannot make*” (*ibid*).

6.4 The Rise of Climate Change Adaptation

Climate change had “*become increasingly recognised as one of humanity’s most challenging environmental issues*” (e.g. Gasper, 2011; Lankao and Dodman, 2011; Susskind, 2010). “*Almost all*” countries signed the Kyoto Protocol in 2008 to meet greenhouse gas reduction targets, an average reduction of 5.2 per cent from their 1990 emission levels by 2012 (Susskind, 2010, p217). With doubt that the targets would be met, the “*most likely scenario*” was that global temperatures would rise and cities around the world would have to cope with the impacts of a global temperature rise, a rise of more than 4°C considered “*catastrophic*” (*ibid*). In England and Wales, by the 2080s, the average temperature was expected to rise by between 2.8C and 3.5C. With the rising temperature the expectation was precipitation patterns would change, being more variable and with greater extremes, drier in the summer (although with more intense and frequent storm events), and between 5 to 20% heavier, more frequent and intense in the winter (Djordjevic’ *et al*, 2011). Adaptation to climate change did not initially attract as much attention as mitigation; “*adaptation has been the poor cousin, but it is now beginning to be taken seriously*” (A09/7, Defra). Davoudi (2012) postulated that there was a belief that adaptation was more a developing country’s problem arguably and also that it might

distract governments' attention from carbon reduction. There was allegedly nervousness within the government on how it could be sold to the public, although it *"sounds great, a climate like Portugal, but our infrastructure and development is not built for that....we have to adapt!"* (A09/7, Defra). An adaptation team of thirty people had been formed in Defra in 2007, *"prior to that there had been one person in the whole of government, compared to a whole department for mitigation"* (ibid).

Although the changing physical conditions of the climate had been researched over the past few decades, with the quadrupling of urban population between 1950 and 2007 and with more than half of the world's population now living in urban areas, the profound implication of climate change impacts on *urban* areas began to be debated (Gasper, 2011; Romero-Lankao and Dodman, 2011). Urban areas were seen to have unique characteristics that rendered their residents and assets particularly vulnerable to climate change, with many large urban centres located on major rivers, *"economic capital and human populations"* were at significant risk of climate related hazards including severe precipitation (Gasper, 2011). Cities began to pay attention to the risks posed by global warming and climate change; planners were to *"embrace the uncertainties involved"* and *"take the lead in preparing climate mitigation and adaptation plans"*, to look for public investments and resource allocation choices that made *"sense for other reasons and reduce vulnerability and enhance resilience"* (ibid). If not, the risks *were* said to be substantial, and the costs of not taking them into account were *"likely to be enormous"* (ibid). The Summer 2007 floods had been attributed to climate change and Sir Pitt's recommendations were recognised by industry experts as requiring an *"overhaul"* of existing practices (The Times, 2008a).

Climate Change Adaptation – Urban Resilience

Flood defences were described by Alastair Dale (Capita Symonds) as *"quick fixes"*, *"large projects literally to plug the gaps"* and that we were *"entering an era where the cost and lifetime of such schemes will make them unfeasible"* (The Times, 2008a). Without *"decisive action"* the previous year's summer floods would leave *"future generations increasingly subjected to lengthy periods of hardship"* and *"unsustainable economic burdens"* (ibid). We were now to consider a *"fallback position"*, to contemplate *"how systems might fail when they are subjected to extreme forces of nature"*, what we could do to minimise *"the consequences"* when it did fail and introduce policy, process and practices to deliver *"affordable infrastructure"*, that was *"not only safe now but also for a landscape 100 years hence"* (ibid). Both *"high level"* policy and planning guidance

should be geared up to set up the agenda for “*step changes in the response to sustainability, flood risk management and climate change*”. However, Dale expressed concern regarding the “*huge inertia associated with the way people view the world*” and the “*radical restructuring*” of ‘coastal’ (not fluvial floodplain) communities that “*simply won’t be achieved through application of existing policies and practices*” (*ibid*). As climate change lay “*at our doorstep*”, replacing infrastructure (drains and sewers) not designed for climate change conditions, was considered “*horrendously expensive*”. Using the latest computer simulations, it was considered possible to generate high-quality predictions of flood hazards and to test a wide range of adaptation strategies. A “*conceptual change*” was made in our approach to spending; “*we traditionally place great store in those who can ‘do it for less’ and the savings to be gained from ‘value engineered’ solutions are firmly ensconced in the minds of those who design and invest in infrastructure. Successful strategies must introduce rewards for identifying the ‘adaptation benefits’ achieved by spending a little bit more now so that future generations are properly protected*”.

Resilience, in the context of flood risk management, is defined by Djordjevic’ *et al.* (2011) as “*the capacity of a system, community or society, potentially exposed to hazards, to adapt by resisting or changing, in order to reach and maintain an acceptable level of functioning and structure*”, or simply stated as the four ‘R’s ; “*resisting, recovering, reflecting and responding*” (p864). With the recognition that there are limits to structural flood defence in the face of climate change, and continued pressures for development, the ‘problem’ has shifted from the actual flood to the communities at risk of flooding (Butler and Pidgeon, 2011). Penning-Rowsell and Wilson (2006) had already noted that both flood hazard literature and policies (Defra, 2004; Evans *et al.*, 2004) were focusing more on “*receptor vulnerability*” as ideas moved away from “*‘defending’ a population and its assets against a hazard*”, towards a “*combination of tackling both the probability of an event and managing its consequences for the communities at risk*”. ‘Vulnerability’, although noted to be a complex and contested concept, was defined by Penning-Rowsell and Wilson (2006) as a “*function of both susceptibility – how easily is the human system damaged – and its resilience – how easily can it recover from a damaging event*”. Concerned that the Government saw an emergency response to floods “*as a low-cost or even a cost-free option*”, the authors revealed results from their study that total emergency costs had been significantly underestimated in previous studies (Parker *et al.*, 1987 in Penning-Rowsell and Wilson, 2006), and were “*much larger than we had hitherto appreciated, at approximately 15 per cent of total economic flood losses*”. The implications of the study, “*we should take this topic more seriously in the future than in the past,*

within a 'portfolio' approach to countering increased flood risk (Evans et al. 2004), but continue to enhance the performance of response activities to ensure that this effort is as effective as possible in facilitating post-event recovery”.

UK CIP 2009

June 2009, and the UK Climate Impact Programme published their report predicting the effects of global warming over the next century. One home in six in England was now at risk of flooding, and according to EA estimates, £20 billion needed by 2035 for defences to protect properties from rising sea levels and extreme rainfall, to protect homes at highest risk (The Times, 2009b). The Times (2009a) reflected *“that our wealthiest and most populous city is slowly sinking into the Thames Estuary has been known for decades, and yet still we are doing laughably little.....If Mr Benn was discharging his duties properly, he would break off from lecturing us about carbon emissions and start planning at once to replace the piddly little Thames Barrier at Woolwich with a proper barrage, from Southend to Sheerness, like the one the Dutch built across the Zuider Zee, complete with hydroelectric plant. I know it will be expensive, and may even require a few climate change co-ordinators to be made redundant. But compared with the cost of losing London, it will be peanuts”* (The Times, 2009a). Nick Starling, director of general insurance at the Association of British Insurers; *“It is vital that Government now sets out a long term strategy for dealing with this increasing risk”* (The Times, 2009b), under the industry’s flood agreement ABI members were to continue to offer renewal terms to existing customers, until 2013, provided that the flood risk was adequately managed (The Times, 2009c). *“Insurance has to be last line in risk management; the alternative if flood defences cannot be maintained is no cover”*, but although stressing ‘flood defence’ through the media, an ABI representative stressed that there was a need for a better understanding within planning to tackle the problem, we *“need blue ribbons through cities....it is like building a motorway and won’t happen overnight, it will take 20 years or more”* (G10/3, ABI).

Wordsworth’s Favourite River – The Derwent

Exceptionally prolonged and heavy rainfall on Wednesday 18 and Thursday 19 November led to severe flooding across parts of the Lake District. Some areas of high ground received more than 400 mm of rainfall in a 72-hour period, and Seathwaite, Cumbria, recorded 316 mm of rainfall within 24 hours (Met Office, 2009). Chris Smith (2009e), Chairman of the Environment Agency, writing in the Times cast back to a

Romantic era and William Wordsworth's poetry *"which so well captures the impact of this precious landscape on the human soul"*. The Derwent was Wordsworth's favourite river, in which *"he wrote movingly about the way it ran past his childhood home in Cockermouth"* in 'The Prelude'. Yet when Smith stood by the River Derwent the previous week he saw *"surging, angry water that was flooding so ferociously through the streets of the town, past and through his former home. No gentle murmurs here; this was an overwhelming force of nature, causing huge destruction and distress to the people of Cockermouth, Workington, Keswick and elsewhere"*. The Lake District was very close to Smith's heart, having *"tramped the fells over a lifetime of years"* and *"wandered beside the streams and becks and waterfalls....it grieves me sorely that these same streams and becks have now brought such human tragedy to so many people"*. Yet answering questions as to whether this flooding could have been prevented, he believed *"nothing could have withstood what happened last Thursday and Friday.....I know that any kind of defence would have been overwhelmed...even an 8ft wall around Keswick or Cockermouth would not have prevented the flooding"*. Quoting *"not just concrete walls"* but flood storage, land management, porous surfaces and resilience; *"we have a major challenge ahead to protect our communities without simply concreting over or building high walls across our green and pleasant land"* (*ibid*).

Back in Tewkesbury, there was anger at plans to build new houses on the floodplain, under the regional plan, 14,000 new houses had been proposed for the Tewkesbury area. *"You put that many houses in a flood-risk area and water displacement becomes the issue"*, stated Laurence Robertson, Tewkesbury's Tory MP. A Tewkesbury resident had started studying drainage and flood alleviation policy; *"the best way to avoid another Tewkesbury is to dig more ditches and clean out the existing ones, along with the drains, culverts, streams and rivers that have suffered from decades of neglect"* (*The Times*, 2009c). Dave Witts, secretary of Severn Avon Valley Combined Flood Group stated *"our county council has taken up the cudgels and started clearing the drainage systems with no help from the Government....The drainage systems in the UK have suffered with 30 to 40 years of neglect"* (*ibid*). Similar opinions were expressed by a Councillor and former engineer in Hull regarding dredging; *"we have got to take the roots out"* and *"we need to go back to engineering first principles..... I learnt that putting something in the way of water stops it"* (A10/10). Professor Colin Thorne (fluvial geomorphologist, University of Nottingham) wrote a letter to the Times (2009f), challenging the conclusion that flood 'prevention' is much cheaper than flood 'protection'; the *"the key to managing flood losses and misery does not lie in the appointment of a 'floods czar'. It lies in integrated flood risk management (delivered by multiple agencies and stakeholders) that couples 'making space for*

water' through reconnecting rivers to their natural floodplains and wetlands wherever possible, with accurate flood warnings, dependable flood defences, efficient flood-event management and effective recovery strategies for those people and businesses unfortunate enough to be affected by flooding". Thorne continued, "floods like those caused by the huge amount of rainfall experienced in Cumbria cannot be entirely prevented and attempting to do so through river dredging and vegetation clearance would be unsustainable not only in terms of the adverse impacts on habitats and biodiversity, but also in terms of capital costs, repetitive maintenance requirements, aesthetic degradation and social inequality".

6.5 The Vast Soggy Floodplain of Global Finance

Whilst unsure of extending newly acquired discourse analysis skills to the economic field, the media's use of pathos as the financial crisis hit British shores in 2008 cannot be resisted; *"There's a slightly postdiluvian feel about the world this week. Across the vast, soggy floodplain of global finance, small knots of financial refugees are emerging from their emergency shelters, sharing war stories, bucking each other up, perhaps even permitting themselves a smile or two as they look back with a shudder on the events of the past month. The waters haven't receded completely, of course. But they have stopped rising.....The credit markets remain in a highly unusual state of stress, but, at least as measured against the wild and terrifying movements in things such as Libor of the past few weeks, they are calmer. A deep and potentially long recession, the worst in at least a quarter of a century, seems inevitable"* (The Times, 2008). In retrospect the Times (2012) reported, *"the first cracks were imperceptible. No one heard the housing bubble burst in the US. But then, like some onrushing tide, came the collapse in value in US securities, the Lehman Brothers farce, stock market slumps, bank bailouts and the worst financial crisis since the Great Depression"* (The Times, 2012).

Arrested Development

Since the 1990s, it would appear to the Times, "much town-centre building, once the preserve of the council, has been powered by a marriage of convenience between local authorities and private developers. Councils found that they could meet government housebuilding targets and affordable-housing quotas and provide all the services these require - shops, health centres, bus services - by contracting them out to developers, who could comfortably afford to deduct the cost from the large profits that they made from property sales and commercial rents. The benefit to councils was "enormous". This was a "lovely moment of mutually beneficial public/private harmony, but it depended on an

unsustainable model of galloping property-price inflation. This, of course, evaporated in late 2007” (The Times, 2010a). In the context of the recession, Suzy Nelson (2011) quoted a number of commentators with a growing concern over the past decade about the quality of new housing (Ball, 1999; Carmona et al., 2003; Commission for Architecture and the Built Environment (Cabe), 2004) and who had criticised the “*short-term approach to most investment in the built environment in the UK and suggested that it is time to review the business model that underpins housing production*” (Parkinson et al., 2009; Simmons, 2009) (p4). Volume housebuilders, now responsible for 80% of the housing stock, prioritised buildability and standard designs with the primary objective to maximise profits from the sale of the homes produced. This business model “employed by most of the major housebuilders” was described by an influential commentator as ““build it and b*****r off” (Simmons, 2009 in Nelson, 2011). In perhaps what can be considered a more objective study, CABE’s audit of new Housing in London, the South East and the East of England (CABE, 2004) used the ‘Building for Life Standard’ to assess the quality of 100 schemes that had been completed by volume housebuilders. 61% of schemes were assessed as ‘average’, only 17% were ‘good’ (Nelson, 2011). A subsequent review by CABE of nearly 300 developments in 2007 found “the quality of a substantial minority of developments – 29 percent – is so low that they simply should not have been given planning permission” (CABE 2007 in Rozee, 2008). A Welsh AM expressed the opinion to a UK volume house builder, “*that whatever the crisis now, you don’t sacrifice design as housing lasts two hundred years..... in the debate on design, we didn’t face up to poor quality box housing from national house builders*” (A11/10, Planner). To which the house builder replied that their business plan “*was volume development, I have only seen the design commission twice in my career, we see it more for bespoke development*” (C11/10, Developer).

Flood Defence Funding Cut, Privatisation Afoot

Chris Smith, Chairman of the Environment Agency was back in the Times (2010b), concerned the Government was contemplating a part-privatisation of the flood-defence system; “*probably involving the water companies - in an attempt to save some of the £629 million annual cost*”. Smith was also worried about the “*questionable methods of some climate-change campaigners*”. In his view the “*University of East Anglia e-mails and the IPCC mistakes*” had set back the almost universal acceptance that the climate was changing; “*this new mood of scepticism is a real worry, because all the signs suggest we are going to see more extreme weather - more deluges, more droughts, more floods, more erosion - over the next 20 years. We need to accept this*

evidence, find ways of coping with it, and build that into our budgets". The Royal Society was forced to rewrite its guide to climate change and to admit that there was a greater uncertainty about temperature increases than it had previously suggested. The new document, 'Climate change: a summary of the science' now states that "*some uncertainties are unlikely ever to be significantly reduced*"; unlike the document it replaced, it also refrains from advising governments about how they should respond; "*the working group that produced the new guide took advice from two Royal Society fellows who have links to the climate-sceptic think-tank founded by Lord Lawson of Blaby*" (Nigel Lawson, Former Chancellor of the Exchequer for the Thatcher Government, 1983-89) (The Times, 2010c).

Paid Ecosystem Services

The ecosystem services approach had been gathering momentum for a number of years, in 2011 the "*ground-breaking*" National Ecosystem Assessment was published, in which the Government "*clearly demonstrated the wider value of the natural environment to society as a whole*" (CIWEM, 2012). The Ecosystem Goods and Services approach was described by CIWEM as "*a way of understanding, quantifying and building in multiple benefits and greater cumulative societal value*". However, whilst the routine application of valuation methodologies, such as cost-benefit analysis and cost effectiveness analysis, was now common in all sectors of water management, "*their application to the full range of services provided by ecosystems [was] not yet standard practice*" (*ibid*). Ecosystem goods and services thinking was now termed '*extended cost benefit analysis*' by advocates of the approach, to connect with multiple funding partners. Defra was said to be helping to mainstream the ecosystem approach into "*real world markets*" with its tool "*payment for ecosystem services*" (PES) to create mutually-beneficial markets between those who benefit from services and those who manage ecosystems (*ibid*). The Government's Natural Environment White Paper (2012) stated that "*we will publish an action plan in 2012 to expand schemes in which the provider of nature's services is paid by the beneficiaries, after undertaking a full assessment of the challenges and barriers. We will introduce a new research fund targeted at these schemes and will publish a best practice guide for designing them*".

The ecosystem approach was seen to come from ecologists, but they were not the target audience, the idea was "*to convince the water sector that they need to use them*" (E12/3, Academic Ecologist). "*The worst thing to do is to come in as a outsider and tell others what to do*", although it was noted we "*say the same things... we say it in different languages*", it was

considered important to *“use their language and integrate into their approach”* and as a *“real advocate for valuing things, we need to talk in the language of the treasury”* (E10/14, Consultant Ecologist). Defra’s new partnership approach to funding flood risk management was seen again to present opportunities for developing flood regulation as a paid ecosystem service, notably through the new focus on local communities as paying stakeholders in the management process. However, a clear commitment was not evident from Defra to integrate flood risk management and biodiversity; *“this is so important if we are going to deliver. Unless there is a clear commitment to an integrated approach other than more words”* (F12/3, Academic Geographer). It was considered necessary to develop a *“greater understanding of synergies and trade offs....A lot of the information is there, but it is not integrated and there are many bailiffs protecting the data”* (F12/3, Academic Geographer). ‘Integration’ was seen as key, and of the stakeholders one observed influential academic considered *“development planning is at the top. Unless this is fed into development planning, it is not going to cut any ice”* and we shouldn’t *“lose sight of...the impact that it has”* (*ibid*). As the rural environment dominated discussions, it was considered that the same principles on PES were *“more difficult to do”*, as *“the urban environment is less connected to water”* (A12/3, Private Sector Geographer). A Defra economist believed a *“lot of the detail if ecosystem services works still needs to be nailed down....Defra wants to end the approach that flooding is government’s problem, it is a shared problem between government and communities. As this beds down, we can formulate some solutions to these problems”* (I12/3, Defra Economist).

6.6 The National Planning Policy Framework

A jointly commissioned review by Killian and Pretty (2008) (Pretty - former group chief executive of Barratt Developments plc.) of the planning application process, by the Department for Business, Enterprise and Regulatory Reform and the Department for Communities and Local Government, reported findings and recommendations in November 2008 on how the planning application process could *“be improved for the benefit of all involved”* (Killian and Pretty, 2008 in Rozee, 2008). The final years of ‘New Labour’ further concentrated the institutions of regional planning on economic development goals (HM Treasury *et al*, 2007 in Cowell and Owens, 2010). After *“the longest planning inquiry in British history, into Heathrow’s Terminal Five, which took four years and cost an estimated £80m”* (BBC News, 2010) legislation was enacted to fast-track decision making for major projects under the ‘Infrastructure Planning Commission’ (Cowell and Owens, 2010). In what Cowell and Owens (2010) describe as a *“somewhat breathtaking pace of*

change in the structure of English planning”, their prediction that the settlement of the 2004 Planning and Compulsory Act would prove unstable came true, as the Conservative/Liberal Democrat coalition government was elected in May 2010, and “*promised to dismantle almost the entire system of regional-level planning in England, seeing it as a costly layer of bureaucracy and preferring to place its own emphasis on ‘localism’*” (p954). As part of their broader ‘Localism’ agenda, the coalition government proposed a *new* land-use planning system, “*built mainly from the ‘bottom’ through the promotion of forms of community-led plans*” (Bishop, 2010).

In September 2011, in a joint article by the Secretary of State for Communities and Local Government (Eric Pickles) and *the Chancellor* (George Osborne) in the Financial Times, planning reform was announced as key to England’s economic recovery; “*Opponents claim, falsely, the government is putting the countryside in peril. We say that sticking with the old, failed planning system puts at risk young people’s future prosperity and quality of life. No one should underestimate our determination to win this battle. We will fight for jobs, prosperity and the right protection for our countryside*” (CLG, 2011). Planning delays were claimed to cost the economy £3bn a year, be a deterrent to international investment and a barrier to the expansion of home-grown enterprise. The aim of the Government’s new ‘National Planning Policy Framework’ was “*simple*”, the draft reduced policy “*from more than 1,000 pages to under 100*”, and was said to “*pave the way for swifter, clearer decisions*”. In recent years, the ministers declared “*planning has come to be seen as a tool to say ‘no’ to growth; as a means to delay and block.... Instead of stopping development, we want to support the right development. At the heart of the framework is a ‘presumption in favour of sustainable development’*”. The Government announced they were “*abolishing the old regional strategies and housing targets*”. Through neighbourhood planning, “*a key new right in the Localism Bill, communities will soon have the chance to say where they want new shops, homes and businesses to go, and what they should look like*” (ibid). Labour’s house building targets were scrapped by the coalition government, along with a halving of the budget for the Homes and Communities Agency (HCA), from £8.4 to £4.4 billion for the next four years (Hall, 2011). The coalition instead pledged to ensure a long-term supply of homes by decentralising planning laws, under a ‘Home Bonus scheme’, the Government would reward local authorities that gave planning approval to housing developments by “*matching pound for pound the new council tax revenue generated for a period of six years*”, to overcome local concerns that the new house building would result in a financial strain on public services. Hall (2011), economist,

concluded “if increased ‘localism’ [was] the policy carrot, then reduced funding appears to be the stick” and the policy would need to be revisited over the lifetime of the coalition to see “if the threat of increased local taxation/reduced funding [had] overcome any so-called ‘not in my back yard’- based opposition to new development”. Whilst councillor and former planner pronounced, “when I heard David Cameron say ‘presumption in favour of sustainable development’ – I thought ‘how dare you’ – you mean ‘presumption in favour of development’” (A11/10, Planner).

A Builder’s Charter, but not for Flood Defences

The Guardian (2011) proposed the updating of the system in the local government department was “hijacked by a group of ‘practitioners’, mostly builders and developers, and slid into print”. The claims that ‘planning delays cost the economy £3bn a year’, the Guardian termed a “ridiculous figure” and “impossible to source but appears to come from the British Property Federation”. The counter evidence of “the vast distribution sheds that now coat the East Midlands countryside and the hypermarkets that encircle almost every English city and town, ‘doughnutting’ their centres with blight” was cited as there was “simply no evidence, beyond the bowls of lobbyists, that land-use planning impedes growth. Most planning applications are handled within the three-month target, and fewer than 1% take more than a year; 80% of applications are approved, and 90% of big commercial ones”. The Guardian quoted a recent Grimley industrial survey, with commercial space availability as ‘the highest for 14 years’, and business park availability at 17%. In addition to 750,000 houses lying long-term empty, permissions existed for 330,000 unbuilt houses, “with 280,000 of them in the banks of the 11 largest developers who now constitute the lobby”. Whatever was causing recession, the Guardian concluded, it was “not land shortage”.

The National Trust believed the overall purpose of planning, to work in the public interest, balancing social, environmental and economic needs, should not be changed; “as it stands, the draft NPPF makes planning a tool for delivering economic growth” (The Times, 2012). The Chief Executive of the Wildfowl & Wetlands Trust, Chris Spray, sat at the desk of the Trust’s founder, Sir Peter Scott, and pondered whether wetlands were now safer or more endangered than in his time; “despite our much greater understanding of the value of wetlands in carbon storage, reducing flood risk, pollution control and food production, we still treat wetlands either as though they can withstand any attacks that we throw at them or as though their fate does not matter”. He noted that in the debate over the Government’s proposals for the planning system, “the words ‘sustainable development’ keep being used. A more intelligent and

sustainable use of wetlands in urban and rural contexts, at home and abroad, would do much to improve the lives of people and to protect the wildlife” (ibid). The Chartered Institute of Water and Environmental Management’s (CIWEM) Executive Director, Nick Reeves, stated *“Surely a new planning framework is an opportunity to do things better? But, sadly, this Government’s proposals are little more than a builders’ charter and a sop to the powerful construction lobby. Developers will be rewarded while neglecting sustainability and the environment. There is no presumption in favour of sustainable development; it is just that of development, cynically green-washed.....Urban sprawl and poor design of the type seen in the pre-war and post-war periods is back”* (CIWEM, 2011). Reeves also felt that planning should not be simple, it needed to consider a wide range of factors, *“the sum of which equates to people’s quality of life.”* The framework was considered a *“clear affront”* to the Natural Environment White Paper which had also been recently published, to reverse the decline in natural capital and not accelerate it. The fact that the present system seemed *“like a lumbering leviathan”* was attributed by CIWEM to low resources in local authority planning departments; *“in this attempt, the Government has confused clarity with brevity, and communities and their environments will suffer as a result (ibid)”*.

The Association of British Insurers (ABI) director general, Otto Thoresen, was worried that the draft National Planning Policy Framework could lead to a *“rise in inappropriate developments”* in flood risk areas, stating the current *“rigorous planning system”* stopped builders from developing areas at risk of flooding. He predicted the *“result would not be stimulation of the economy but misery for people when their homes are flooded”* (The Telegraph, 2011). The National Flood Forum’s chairman, Charles Tucker, wrote to the Daily Telegraph, stating that the new framework *“has, at a stroke, scrapped the carefully constructed raft of technical guidance, context and definitions built up over years”* for flood protection (ibid). In Sussex, *“Looking north from Yapton you can see across the fields to the winding River Arun, Arundel Castle and the brow of the South Downs. Visitors are advised to enjoy the view now because, within months, work is due to begin on a 173-house development on the northern fringe of the sleepy Sussex village. The villagers say that the view was an early casualty of the National Planning Policy Framework (NPPF)”* (The Times, 2011b). The plans for the housing estate had been rejected by the parish and district councils last year, the developer appealed, the Planning Inspectorate ruled in the developer’s favour. The housing estate was in a flood risk zone. The villagers were working on their own neighbourhood plan under the Localism Act 2011; Trisha Wales, a retired teacher, said: *“It was all down to one government*

inspector and he approved it. I want to ask David Cameron, 'Where's your localism? Where's your Big Society now?'" (ibid).

"Flood defences for thousands of homes and businesses will be cancelled today, only 24 hours after the Government's engineering advisers said that the risk of serious floods was rising" (The Times, 2011a). Leeds lost its "long-planned £100 million scheme to protect the city centre". Annual spending was to fall from £354 million in 2011, to £259 million in the subsequent four years. The announcement followed a report, released the previous day, commissioned by the Department for Environment, Food and Rural Affairs, which warned that there was a heightened flooding risk due to climate change and "lax planning policies that had permitted development on flood plains" (ibid). An article from the Proceedings of the Institution of Civil Engineers, by a Local Authority engineer, McRobert (2010) posed the question, under limited resources, what is it that the engineer and local council should be looking to avoid? "The risk of flooding has also been exacerbated by the growth of towns. Rain, instead of falling onto absorbent fields or woods, now falls onto roofs and roads, draining swiftly into watercourses, increasing storm flows and creating new flooding problems where none existed before" (p261). McRobert quoted two examples of personal tragedy from the insurance losses reports. A mother's grief of how she would tell her daughter as she grew up, that she had no photographs of her babyhood, as she and her husband had just fifteen minutes to move their most valuable possessions upstairs and the elderly widow in poor health who lost every memento of her life and marriage prior to the flood, as well as her home. These domestic tragedies, repeated in hundreds of homes across Northampton and surrounding areas, McRobert pointed out "may not easily be accounted for in any subsequent cost-benefit calculations.....The avoidance of such situations arising should be the clear objective of the municipal engineer". As flooding has been recorded since records began, McRobert believed civil engineers did their "professional standing no service" if they "routinely offer[ed] the excuse to residents affected by inundation that it was an unexpected, exceptional, event". The new legislation being introduced was seen by McRobert to bring significant powers to the local authority engineer; "budgetary pressures will mean that progress may be difficult but the technical framework is available for us to use. Engineers should use this opportunity to lobby government, at national and local level, for the resources to provide and maintain the infrastructure that is required" (ibid, p261).

Summer Floods 2012

Flood warnings were in place again across England in the summer of 2012, as heavy rainfall followed the wettest April on record. As a second weather system driven by the jet stream looked set to stall over the country, Thames Region EA staff were on “*their toes*” as the “*Olympic sites [had been] carved out of the floodplain*” (A12/5, EA Engineer). As the agency was set to start its tri annual review in October, through Defra, a practitioner stressed “*your guess is as good as mine – politicians do like to make changes, so there are potentially more in the pipeline*”, emphasising that the problem was not Defra, but that “*there could be a change in Secretary of State, the current one knows her stuff*” (B12/5, EA Engineer/Hydrologist). Although the downpours ensued, they followed a dry winter, “*the environment secretary Caroline Spelman warned yesterday that families may eventually have to rely on standpipes in the streets for their water*”. The Independent noted “*Measures promised by central government to help bolster Britain's flood defences have still not been completed five years after the flooding that prompted them, it emerged yesterday, as continued downpours led to more than 1,000 people being evacuated from their homes*” (The Independent, 2012). Professor Dominelli (Durham University, Department of Hazard, Risk and Resilience) raised her concern that the lack of funding meant measures could “*go down the road of community resilience; that would mean some flood defences being the responsibility of the ‘Big Society’ – hoping the local people and volunteers will do everything. They cannot. On one new housing estate I saw piping 12 inches in diameter being installed to carry water away. That is just not going to be able to cope*” (*ibid*). Summer 2012 has been one of Britain’s wettest on record, the Association of British Insurers (ABI) claimed the £17 million a day losses were the worst since the summer of 2007 (The Guardian, 2012). Nick Starling, the ABI's director of general insurance, reported that the industry was trying to “*hammer out a new flood agreement with the government, without which some homes in high-risk areas could be left without cover after next June, when the current agreement runs out*”. On the 4th September, 2012, Caroline Spelman was replaced by Owen Paterson, former Shadow Minister for Agriculture 2003-05 and alleged climate change sceptic. Roger Harrabin, BBC News reported; “*If nothing else, the reshuffle changes amplify the new tone from the government which once promised to be the greenest ever. Interesting times*” (BBC News, 2012).

6.7 Summary Analysis

The management of flooding in England has shifted from a purely technocratic focus, based on engineering expertise, to encompass a broader social and environmental set of approaches (Newman *et al.*, 2011). This shift is commonly perceived as a transition from flood defence to flood risk management, or working ‘against’ to working ‘with’ nature. Academics, mainly geographers and planners, continue to challenge traditional science, with single discipline, single issue reductionist approaches to research, which alone were not believed “*able to deliver effective, efficient or equitable programmes of measures*” for sustainable development (Blackstock and Carter, 2007, p354). The “*new IWM approaches*”, the implementation of the Water Framework Directive (WFD) and climate change lent growing recognition that water, as a “*common pool resource*”, was seen to require the integration of multiple disciplinary perspectives to resolve place-based problems, in an understanding of how “*biophysical, economic, political, social and cultural systems intersect*” (*ibid*). Geographers saw themselves placed at the heart of the transition to “*bridge bio-physical and social approaches*” and move away from the “*historic focus on biophysically defined or regulatory/technologically focussed approaches*” of the past (Blackstock and Carter, 2007, p354). Although support generally remains strong in the media, accompanied by a vocal set of academic and industry proponents, the evidence presented in chapter 6 concurs with the literature, that the implementation of a more ‘holistic’ approach remains slow and measures that do not rely on engineered, structural defences still form the weakest element of the ‘portfolio’ of approaches (*ibid*). Floodplain restoration remains opportunistic, although funding for schemes appeared to have shifted from the back of flood defence schemes to the implementation of the Water Framework Directive. This has lured the ‘policy entrepreneurs’ of floodplain restoration deeper into rural territories. Thus the policy implementation deficit for floodplain restoration, in particular, remains stubborn and the ‘window of opportunity’ following the 2007 summer floods has not been taken.

Climate Change – the New Emblematic Issue

Climate change had become what Hajer (1996) would term the ‘emblematic issue’ for the environmental problematique at large. Economic discourses were neatly aligned with climate change ‘mitigation’ and an emphasis on ‘technological innovation’ (Davoudi, 2012). The shift in emphasis within the flood risk management policy

arrangement to ‘resilience’ was also aligned with neo-liberalism; “*the object to be governed has to some extent shifted from actual flood waters, to those citizens at risk of flooding and the agencies or organisations with designated responsibilities?*”, that is local councils and the EA (Butler and Pidgeon, 2011). Originating from Labour and now driven by ‘localism’, the Government are trying to encourage local responsibility, for local communities to understand flood risk management and to ‘learn to live with it’ (*ibid*). Climate change and resilience is also aligned with the engineering ideologies, with the uncertainties we see a heightened quest for control, with a plethora of computer modelling, to try and bring this uncertainty into a range of the “*so called predictable probability*” (Johnston et al., 2000).

Allmendinger and Tewdwr-Jones (2006) aspired for spatial planning to be viewed as a “*strategic capacity and political integration mechanism intended to cement the increasingly fragmented agents of the state, all of whom possess their own agenda, political objectives, strategies and resource, but who need to co-operate in order to deliver projects and developments*” (p17). Planning academics, Kidd and Shaw (2007) viewed that the inadequacies of existing water management arrangements had “*become all too apparent*” in relation to climate change, exacerbated by the nature and location of development and patterns of human activity. They saw “*fragmented administrative structures in which policy and operational responsibilities [were] divided between a disparate array of organisations, narrow sectoral decision-making systems with competing and contradictory objectives, a disconnection between national, regional and local-level activities and the lack of effective planning and management at the catchment level*”. In considering the strengths and weaknesses of the new spatial planning system in England, and its potential to contribute to integrated water resource management activities, Kidd and Shaw (2007) argued that, taken overall, spatial planning was “*well placed to meet these challenges and it could in fact play a much more central role than [was] currently envisaged*” (p312). Whereas in chapter 4 of the thesis, it was surprising to witness planners resisting development on floodplains, contrary to popular contemporary opinion, the discourse thread that local planning authorities ‘do not apply planning controls on floodplains rigorously enough’ continues. In chapter 6, development proceeds on floodplains, under the auspice of sustainable development, against the illusory rhetoric that there are planning constraints in place through PPS25. Whilst practitioners have been blamed for lack of integration and policy implementation deficits more broadly in spatial planning, the main fracture in “*narrow sectoral decision-making systems with competing and contradictory objectives*” clearly lies at

the level of the policy-making function in central government at the heart of national government. As Cowell and Owens stated in 2006, the emphasis on simpler planning documents and swifter processes would potentially conflict with “*full and proper scrutiny of environmental and social considerations*” (p27). Tewdwr-Jones (2008) also believed that “*though planners [had] been represented rhetorically as empowered agents of change, there have also been persistent fears that the attitudes and lack of commitment of “those who operate the system” may be acting as a barrier to the realisation of spatial planning in practice*”. ‘Sustainable development’ articulated in the Labour government’s policy was criticised for being too weak and for being implemented too slowly because of the belief that economic growth should still drive policy decisions (Kelly *et al.*, 2004). Kelly believed that if planning were to have a powerful integrative role, the system needed “*to be given intellectual credibility and rescued from political spin*” (p314). In the ensuing six years, the capacity of the planning system to deliver true sustainable development has been further eroded and “*sustainability has become a clichéd term that is in danger of meaning everything and thus nothing*” (Kelly *et al.*, 2004).

Get Planners Off Our Backs

As the thesis reaches submission date, September 2012 and Prime Minister David Cameron has pledged to “*cut through the dither*” that is holding Britain in “*paralysis*” (ITV News, 2012). Addressing critics that had dubbed him a ‘political mouse’, Cameron announced he was bringing forward contentious measures to boost growth by relaxing the rules on planning applications, stating; “*A familiar cry goes up, ‘Yes we want more housing; but no to every development - and not in my back yard’. The nations we’re competing against don’t stand for this kind of paralysis and neither must we*”. Frustrated by the hoops you have to jump through to get anything done, Cameron’s measures are to start with “*getting the planners off our backs. Getting behind the businesses that have the ambition to expand. And meeting the aspirations of families that want to buy or improve a home*” (The Telegraph, 2012). The “*controversial measures to sweep away red tape and deliver 75,000 new homes were unveiled by the Government*” the same week “*in an attempt to reverse the chronic shortage of housing and boost the flagging economy*” (The Times, 2012). Planning applications are to be speeded up by allowing the Planning Inspectorate to rule on applications if a local authority ‘has a track record of consistently poor performance’, permitted development rights are to be temporarily suspended and from early 2013 the inspectorate will also be able to reduce section 106 requirements to build affordable homes on sites where the agreements are deemed to be making developments unviable (Inside Housing, 2012).

The backlash has begun, with a media in strong support of a strong planning system. The *Times* (2012) noted the changes, announced only months after a full overhaul of the planning system, *“will make it harder for local residents to object to bigger schemes and could reduce the number of affordable homes being built”*. The new proposals will see *“some large housing schemes are to be treated as projects of national importance and fast-tracked through the planning system by ministers. Builders deemed to be struggling with slow planning departments will also be allowed to bypass councils as more applications are fast-tracked through an appeal process. Developers who can prove that the council’s affordable housing requirements make a project unviable will see the requirement removed”*. The Local Government Association has responded to the latest announcements by publishing figures to show house builders have planning permission for more than 400,000 homes and at *“the current rate of construction it would take developers three-and-a-quarter years to clear the backlog by building all of the new homes local authorities have signed off”* (ibid). Builders now *“believe that more is needed to address one of the biggest obstacles for the property industry - the severe lack of mortgage credit for housebuyers. As a spokesman for the Home Builders Federation put it ‘If buyers can’t buy, builders can’t build’* (ibid). The *Telegraph’s* sketch writer observed *“To the Commons, to hear Eric Pickles explain how relaxing the planning laws will help the economy grow by up to eight metres. Or something like that. The Coalition’s idea seems to be that we can revitalise the nation’s finances and create jobs by doing up our houses. I forget what they’ve called the policy. I think it’s Get Britain Refurbishing, or Get Britain Seeing About That Boiler, or Get Britain Putting Those Bloody Shelves Up Like You Promised Me You’d Do Months Ago* (The *Telegraph*, 2012). Sir Simon Jenkins, chairman of the National Trust, took the changes more seriously *“They embrace the concern of millions of people who share the trust’s statutory mission to protect England’s open spaces and countryside. The present planning framework needs reform, not a car crash. If we can recognise that, we can get together and wrestle the wheel back on course”* (The *Times*, 2012). Claiming the rural landscape will not be ‘concreted over’, *“it would be more like Ireland, Portugal, Long Island or New Jersey: bungalows and buildings spattered in every field, advertising boardings, pylons and turbines along main roads, mini-malls outside towns and boarded-up streets in their centres”*. Jenkins concluded, *“As for defining as ‘sustainable’ anything that yields jobs or profit, this is palpably absurd”* (ibid). However, in a fitting end to Part II, the gloom apparently is not evenly spread, *“the supply of new developments aimed at the very top end, homes worth over £5 million, is set to more than double”* and *“Many of the sites being delivered to high-end buyers over the next five years are dotted along the Thames”* (The *Times*, 2012).

Part III: *Interpretation, Prescription & Reflection*

7

The Institutional Effects of the Discursive Renewal in Flooding Policy Arrangements in England

Any intelligent fool can make things bigger and more complex....It takes a touch of genius – and a lot of courage to move in the opposite direction

Albert Einstein

‘Sustainable’ and integrated flood risk management has emerged as a new policy response in England, with floodplain restoration as an epitome of the new approach. During the course of the research, a complex network of societal discourse centred on the English floodplain, has been disentangled from the 17th century to present day, in the sciences, politics and the media. In **Chapter 7** the nature of change in the flood risk management policy arrangement are summarised, to evaluate the progress of the novel discourse on floodplain restoration across Wiering and Crabbé’s four concrete thresholds, including the emergence of new coalitions, new rules of the game and the division of power in the arrangement (7.1). Section 7.2 analyses the forces for change, that have brought about innovation, including policy entrepreneurs, shock events, processes of political modernisation and adjacent policy arrangements (planning). Having highlighted forces for change, section 7.3 further evaluates ‘forces for stability’ in the power dimension. Chapter 7 thus addresses research question 4 - how, why, and to what extent has the discursive renewal in flood policy had institutional effects?

Back in the 1990's, an influential figure in the flood 'hazard' debate, Edward Penning-Rowsell, set his research within the human ecology paradigm, seeing hazards and their impacts as a function of socio-political forces, rather than physical events and their probabilities. In the recognition that further investment in structural flood-control works alone was both costly and could be environmentally damaging, Penning-Rowsell (1996) detailed the struggle to adopt sustainable environmental management policies in the face of rapidly increasing frequency of major floods and human vulnerability to flood hazard. The goal to shift away from a reliance on engineered solutions toward land-use controls on floodplain development involved substantial practical difficulties; according to Penning-Rowsell (1996), if policy was to become a reality rather than a set of abstract principles, it needed to be embodied in the everyday practices and routine work of the organisations involved. He saw flood control as exhibiting "*too well the problems that habitually arise when national and international agencies attempt to promote sustainability, while those responsible for implementation compete among themselves, remaining wedded to old practices and a deep-seated and bureaucratic self-interest*". He quoted other authors, who had linked decision making about 'natural hazards' to the professional composition and motivations of decision makers, dominated by hydrologists and engineers operating under the perceived primary importance of technical inputs (Sewell 1971; Penning-Rowsell, Parker, and Harding 1986 in Penning-Rowsell, 1996). In addition to engineering mind sets, powerful individuals and groups were also seen to resist the imposition of land-use controls on the development of the unprotected floodplain areas they owned (*ibid*). Any controls were seen to restrict their development rights and curtail the profits that this currently brought. Penning-Rowsell (1996) cited an example of two recently built low-cost housing projects located on flood-prone land to the north and south of a town, "*owing to the low price of this unprotected land*". It was now proposed that the protection of these areas should be funded by the developer, yet although the risk was known at the outset, the housing agency threatened to build in an alternative location. The housing was needed by the local community; therefore the authority funded the defences. Hence in effect, this type of development was subsidised by the costs of the protection provided; or, "*put another way, the difference in land values with and without protection is passed to the developer gratis as an additional element of profit*" (*ibid*). Human ecology research was receiving more attention in the literature dealing with hazards in the developing world. The country concerned in the research above is Argentina, used by Penning-Rowsell (1996) to illustrate how the context is crucial to understanding

hazard-response decisions. The complexity of how institutions respond to hazards, he stressed, required more detailed analysis to better evaluate the incentives and motivations of some powerful individuals, the implementation of non-structural solutions as a response to flooding being a *“more complex process institutionally than are structural, or engineered, flood-alleviation measures”* (p86).

The same principles underpinning Penning-Rowsell’s research in 1990s Argentina apply to the analysis of the policy domain in England. As we knew from chapter 1, there had been a change in Government strategy, broadly defined as a change from flood defence to flood risk management, including floodplain restoration, yet contemporary authors alleged that policy rhetoric had not been translated into practice. Chapter 4 reconstructed the ‘entrenchment’ of the hegemonic flood defence discourse, chapter 5 traced the rise of ‘contesting’ voices to the flood defence discourse (found to be in the form of ecologists, biologists and geomorphologists) and their influence over the Government’s new strategic approach, ‘Making Space for Water’. The flooding policy arrangement discourse and policy dimension has been enriched with ecosystem based ideas, including floodplain restoration. However, chapters 4 and 5 also witnessed the continued encroachment of development on the floodplains, often *against*, the better judgement of local authority planners. In chapter 6, the sustainable development discourse was seen to be ‘hijacked’, under the dominance of a growth (and construction) agenda, particularly following the 2009 global financial crisis. As Penning-Rowsell explains, non-structural strategies almost invariably depend for their implementation on more than one institution (such as flood engineers and land-use planners), this means; *“that the context of one institution’s decisions, policies, and actions includes its partners’ institutions and their characteristics and “Motivations that lead to reticence or resistance by just one partner within this type of fragile multiagency consortium, for whatever reason, can obstruct all progress”* (p87).

7.1 How has the Novel Discourse Progressed Across the Concrete Policy Dimension Thresholds?

In Chapter 3, section 3.4, a hypothesis on forces for change was outlined following Wiering and Crabbé (2006) regarding the sequence of institutional change. As a reminder, they hypothesise that there are four policy dimension thresholds to cross for a novel discourse to institutionalise: firstly the rising of a new, counter-storyline, opposing

the existing and hegemonic discourse; second threshold, the creation of an actor coalition that puts the new ideas into practice with sufficient independent resources to enforce its ideas; thirdly anchoring the new (at this point informal) policy practices into formal legislation or political rules of the game and the final and fourth threshold, that Wiering and Crabbé (2006) consider the most difficult to cross; changing power relations (see figure 7.1).

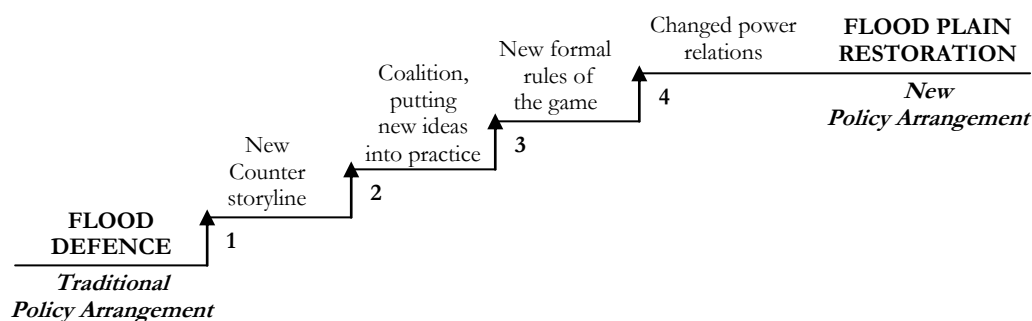


Figure 7.1: The Four Policy Dimension Thresholds for a Novel Discourse to Institutionalise

Wiering and Crabbé see the acceptance of a new discourse as, not surprisingly, easier when the ideas on the existing policy are disputed in the societal and political sphere. The addition of new rules is most often easier than adapting existing rules, this is because the latter would alter the existing, traditional power balance to a greater extent (*ibid*). Finally, to change power relations requires a combination of strong counter-coalitions in order to weaken existing coalitions. These counter-coalitions must have strong storylines, new rules of the game, a redistribution of resources and importantly, the assistance of endogenous and exogenous ‘forces of change’ that, when used strategically, make policy makers susceptible for fundamental institutional change (Wiering and Crabbé, 2006). Section 7.2 will examine the forces for change, but first a summary of the progress of the novel discourse across the policy dimension thresholds.

1) New counter-storyline: Chapter 4 reconstructed the ‘entrenchment’ of the hegemonic flood defence discourse, chapter 5 traced the rise of ‘contesting’ voices to the flood defence discourse, found to be in a disciplinary, or ideological, form of ecologists, geographers, geomorphologists and landscape architects.

2) Actor coalition, putting ideas into practice: Whereas the conventional disciplines in flood defence and land drainage had been hydrology, hydraulics, and structural engineering, public pressure to decrease reliance on environmentally insensitive engineering solutions and EU legislation, started to broaden the scope and disciplinary base from the 1980s (Penning-Rowsell & Handmer, 1988). The discourse analysis within chapters 5 and 6 detailed the counter-coalition's rise in activity. Furthermore table 7.1 provides evidence of some success in putting ideas into practice, detailing urban floodplain restoration schemes dating from 2005.

Table 7.1: Floodplain Restoration Schemes in Urban England

Sutcliffe Park, Greenwich, London

Sutcliffe Park has been highlighted as the blueprint for the Thames Gateway “green grid” for open space, to provide parkland, sports facilities and wildlife habitats that can also serve as “manageable washlands”. Green-grid thinking has developed in the Thames Region perceiving that such green infrastructure should be viewed as essential, as important as roads, services and schools. It could then be part funded by developers through planning gain. Flood Risk Management is high on the agenda in the Thames Region due to regeneration and the building as many as 1,20,000 new homes in the Thames Gateway, half of which could be located on the floodplain. Beyond the Thames Region other schemes have successfully “made Space for the River” whilst achieving multi-functional benefits (CABE, 2005).

Rotherham

In Rotherham flood risk from the River Don presented a major obstacle to regeneration of 14 ha (33 acres) of urban centre land including proposals for 1209 new riverside homes, as with many such programmes in England, placing the river at the heart of its regeneration. Alongside a traditional flood alleviation scheme is a new four-hectare urban wetland nature park in a loop in the river, on some of the land that had previously been earmarked for economic development, designed in partnership with the Wildlife Trust (Wildlife Trusts, 2007).

Doncaster

In Doncaster, a low lying wetland site south of the town, Potteric Carr Nature Reserve, stores floodwaters at times of high water. Formerly fen and bog, it was drained in the mid-18th century for agriculture. The site now supports a wide range of species, including kingfisher and sedge warblers, marsh plants and butterflies. In the summer floods of 2007, the flood waters spilled safely over the banks onto the reserve, which has a flood storage capacity of approximately 2,00,000 cubic metres, and it is stated that thousands of homes were saved from flooding (Pitt, 2007).

Birmingham

Funded by the European Union (EU) Life Programme, the Sustainable Development of Urban Rivers and Floodplains (SMURF) project developed and disseminated a methodology for improved land-use planning and water management in urban floodplains, consistent with the EU Water Framework Directive (2000/60/EC) (WFD) (European Commission, 2000). In the city of Birmingham, the river Tame and its tributaries are typical urban rivers affected by at least 300 years of urban and industrial growth. The project included moving social interests and priorities further upstream in restoration decision-making, in an area of low amenity value facing development pressures on the floodplain (Petts, 2007).

The new coalition actors are formed of geographers, ecologists, geomorphologists and landscape architects, yet much of the activity is ‘mitigation’ of flood defence schemes and confined to ‘river’ rather than ‘floodplain’ restoration, in rural rather than urban areas (*ibid*). The UK River Restoration Project, established in 1991, has been involved in many innovative schemes, their pioneering project restored 1.25 mile stretch of the River Cole, near Swindon. The majority of schemes are in fact undertaken by third sector bodies, implementing schemes under informal arrangements or under European projects; as opposed to the mainstream Capital Projects for flood defence under Defra.

The planner is widely acknowledged to be crucial in finding the land for floodplain restoration. The following illustrate the repetition of texts from observed actors and conversations, including Edward Evans (Co-author, Foresight Future Flooding) and Joe Morris (floodplain restoration academic, Cranfield University):

Blue infrastructure is set to become a major new guiding factor on the way our towns and cities planned. When considered from the outset this can bring many added features and improve the quality of our environment. When integrated into existing towns and systems this too can bring added value (E09/5, Consultant Architect).

Development and planning are going to be critical in the future...we need a long term adaptation of the urban environment, to re-create river corridors, with a long term view of options for redevelopment, a blend of measures to reduce risk, working in partnership to deliver it’ (C09/1, EA Geomorphologist).

Integration is key, of this development planning is at the top. Unless this is fed into development planning, it is not going to cut any ice’ (F12/3, Academic geographer).

How to get 20% more flow down the river and meet other objectives? Pinch some land for the channel, buffer zones, brownfield sites, green; there are opportunities and challenges, this means partnership with planners to get them defined. Is there a clash between PPS25 and sustainable communities? Answer – harmony! We need proper integrated design. In redevelopment there is much opportunity with the natural cycle of redevelopment to think of sustainable solutions’ (B05/2, Engineer).

Planners may not have all the answers but they work with all the partners, and therefore planners hold the key to managing flood risk now and in the future’ (D09/5, RTPi Policy Planner).

Although development and planning are widely considered critical for integrated water management, planners are notable by their absence in water management networks, and thereby the discourse coalition for floodplain restoration. For the majority of the eighteen professional water management events, workshops and conferences attended during the course of the PhD research, the author was the only planner in attendance and the discipline's absence was frequently noted. For example in 2010, at 'Beyond PPS25', Lancaster University Environment Centre, the workshop report recorded "*the event attracted almost 30 delegates with a varied range of interest and responsibilities across flood risk and development planning. Despite being very well advertised by RTPI, few actual planning professionals attended*". An early strong proponent of floodplain restoration and protection, planners have largely disappeared from the floodplain restoration discourse:

Planners need educating in how the water sector plans and funding work, policy to prevent development on the floodplain is a joke (G10/14, Consultant Engineer).

In my opinion development control is rubbish, getting better, but still rubbish (F10/13, EA Engineer).

The Humber Strategy, years in development though consultation and engagement, integrating economic growth with needs of internationally important habitat; the planning application was rejected. The future of a multi-million pound strategy in jeopardy? (E10/14, RSPB Ecologist).

The Liverpool Knowledge Quarter at a local scale, let's 'go back to the formation of planning – Abercrombie, when one of key tenets for planning was open space. But it seems to have been lost, now climate change offers the opportunity to 'sell' GI again (B10/1, Landscape Architect).

Why don't spatial plans have contours? Flat earth? (E10/18, Local Authority Engineer).

Despite the criticism, there is sympathy from some quarters across the professions and there is evidence that floodplain restoration and ecosystem services are seen to be a rural and not an urban issue, planners being somewhat excluded from the debate:

Everytime you open planning mag, there's something else planners need to do; planning for terrorism being the latest (E10/4, Water Authority).

We've heard a lot about the rural environment today [CIWEM workshop, London], in the urban environment the exact same principles apply, but with no disrespect for anyone attending from Local Authorities, it is more difficult to do, the urban environment is less connected to water (A12/3, Private Sector Geographer).

3) New formal rules of the game: table 7.2 summarises the successive changes in legislation from 1930 to 2011. Formal legislation has only served to solidify the traditional policy arrangement of flood defence. Environmental legislation has on the whole only offered the contesting voices policy levers for ‘mitigation’ of the impacts of flood defence. New planning legislation raised the profile of flood risk in planning circles in terms of prohibiting development on floodplains, yet planners are notable by their absence in the innovative use of land and have not taken opportunities afforded them. Section 5.6 described how the novel discourse of floodplain restoration was anchored into Defra’s ‘Making Space for Water’ (2005). However, Making Space for Water stands apart in the table as a merely strategic document, with no formal measures, programmes of work or targets for floodplain restoration.

Table 7.2: Summary of Changes in Formal Rules of the Game (1930 to 2010)

Year	Formal Rules of the Game	
	Water Management	Planning
	Environmental	
1909		Town Planning Act
1930	Land Drainage Act	
1947		Town & Country Planning Act
1948	River Boards Act	
1971		Town & Country Planning Act
1973	Water Act	
1980		Local Government Planning & Land Act
1981		UK Wildlife & Countryside Act
1988		EIA Directive
1991	Water Resources Act	
1991	Land Drainage Act	
1995		Environment Act
2000		Water Framework Directive
2004		Planning & Compulsory Purchase Act
2005		<i>Making Space for Water</i>
2011		Localism Act
2011	Flood & Water Management Act	

In general, environmental policy in England is characterised by a legal system with a strong emphasis on procedural regulation, with a strong tradition of informal regulation through consensus and not coercion (Moss and Monstadt, 2008). The Pitt Review (2008) brought about more fundamental changes, with the Flood and Water Management Act (2010). It is debatable whether the addition of new rules has altered the existing, traditional power balance to a greater extent, a statement that will be further examined in section 7.3.

4) Changed power relations: Although the need for multi-actor policy making now characterises English water management, pre-existing coalitions have been challenged, but not displaced. The new discourse of floodplain restoration competes with the traditional, hegemonic discourse of flood defence, but to date there has not been a true redistribution of power and ecologically inspired actors do not have access to sufficient resources to implement their ideas. As Wiering and Crabbé (2006) state the counter discourse coalitions must have strong storylines, new rules of the game, a redistribution of resources, but importantly, the assistance of endogenous and exogenous ‘forces of change’ that, when used strategically, make policy makers susceptible for fundamental institutional change. Section 7.2 will examine the forces for change in the flood risk management policy arrangement. Section 7.3 will address the power dimension in further detail and the vital, yet absent actor from the coalition, the planner.

7.2 Forces of Change

Wiering and Crabbé (2006) have proposed a summary of key explanatory forces to understand change in a policy arrangement, distinguishing between forces of change that are ‘endogenous’ or ‘exogenous’ to the arrangement. ‘Policy entrepreneurs’ are a force of change endogenous to the arrangement, whilst ‘shock events’, ‘political modernisation’ and ‘adjacent arrangements’ are all exogenous forces (see figure 7.2).

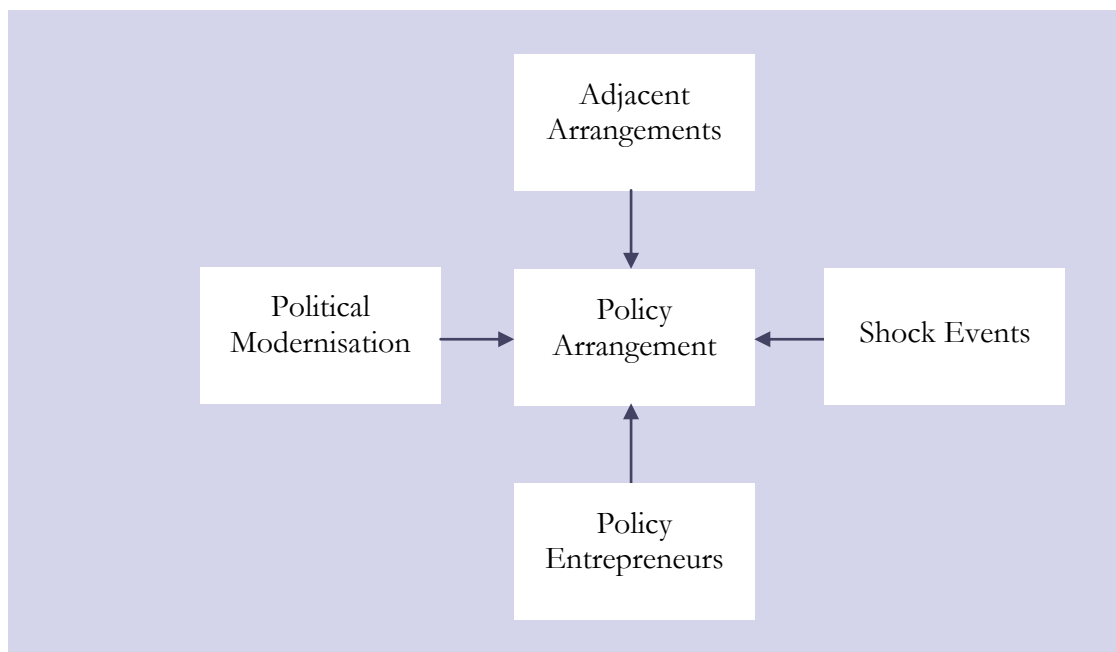


Figure 7.2: Explanatory Factors for Change in a Given Policy Arrangement

Discourse analysts further distinguish these forces of change as bringing about changing patterns of action and behaviour, through changing discourse elements or changes in vocabulary that are processed through actor and structure patterns (Giddens, 1984 in Wiering and Crabbé, 2006). ‘Policy entrepreneurs’ generally hold the perception that there is a need to change the governance capacity of arrangements. In this policy arrangement, the entrepreneurs have been observed to fall within disciplinary boundaries (and inherent ideologies); primarily natural scientists, including geographers, biologists, ecologists and geomorphologists. The exogenous force that takes the form of a ‘shock event’ in society is otherwise known as a ‘discursive event’ by discourse analysts. As a reminder, Jager and Meier (2009) define a discursive event as one that appears in the media and politics extensively and over a prolonged period of time and influences the subsequent development of a discourse. Whether an event becomes a discursive event or not depends on the power constellations present and at work in politics and the media, affecting how people perceive the happenings (*ibid*).

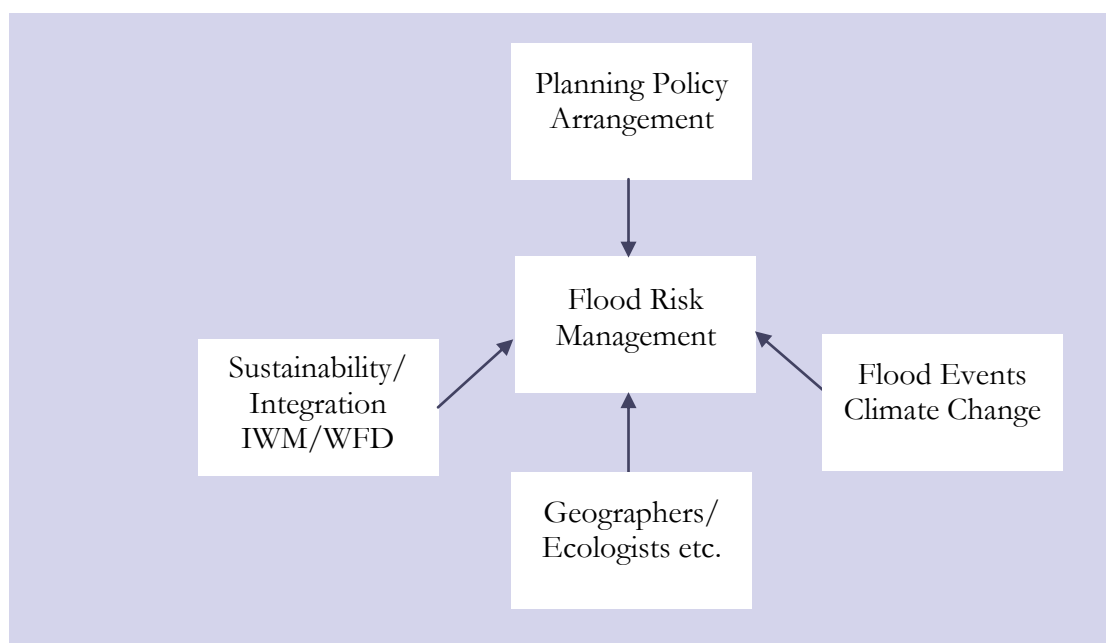


Figure 7.3: Forces for Change in the Flood Risk Management Policy Arrangement

In this case, we have seen shock flood events and climate change affecting the ongoing institutional development of the policy domain. The influence of wider societal processes, political modernisation, are conceptualised in this research as more ‘sustainable’ practices of flood risk management, ‘integration’ and partnership working, across actors, sectors and levels (from section 3.1). These political modernisation forces of change are encompassed within the call for ‘integrated water resource management’,

with the EC Water Framework Directive proving a particularly key force for change. 'Planning', widely considered as crucial to finding the land for floodplain restoration, has been considered in the research as the adjacent policy arrangement (section 1.2). The explanatory factors for change in the flood risk management policy arrangement, and thus our case study of floodplain restoration, are summarised in figure 7.3.

Change in the Flood Risk Management Policy Arrangement

The policy arrangement has undertaken two significant shifts in discourse due to various 'forces for change' since the turn of the century. Figure 7.4 presents a timeline that summarises the ebb and flow of the discourse, under the influence of these forces for change. Table 7.3 represents the discourse of various actors (disciplines and professions) at pertinent 'cuts' in the discourse. Whilst an engineering discourse was well established in the rural sector, following the Land Drainage Act 1930, the force for change or 'discursive event', came in the form of shock flood events in the 1950s, including the loss of lives in the east coast floods. These were regarded in the House of Commons, as an "act of war by nature", the government followed the approach of the Netherlands (also affected by the same storm across the channel) and the US, in a strategy described by Adams *et al.* (2004) as invoking "the protection of society and its capital and infrastructure against the incursions of wild nature" (p1932). The onset of the rise in contesting voices from our 'policy entrepreneurs', was in the late 1960s and early 1970s. As noted in the wider literature, this period was marked by revelations and controversies about the costs of the environmental degradation caused by unrestricted economic development and accelerated population growth (Novotny *et al.*, 2010). Previous centuries had been concerned with human health (hence burying and embanking 'troublesome' water courses), but now the environmental costs of unrestricted growth were considered too high and seen as a serious threat to nature (*ibid*). Hajer (1997) saw the radical environmentalists (including anti-nuclear protestors) of the 1970s emerging as a counter-culture of the 1960s, to not only politicise the environment, but to question the rationality of the whole idea of social 'progress', represented by Rachel Carson's 'Silent Spring' and 'Limits to Growth'. Furthermore, Hajer informs us, these environmentalists warned about the perverse effect of a swift technocratic response; many of the technocratic institutional arrangements, including engineered flood defences, that are now associated with ecological modernisation (*ibid*).

Figure 7.4: Timeline of Forces for Change in Flood Risk Management
- Discursive Events Influencing Change in Policy Responses towards
Floodplain Loss (to the left hand side of timeline) or
Preservation/Restoration (to the right hand side of timeline)

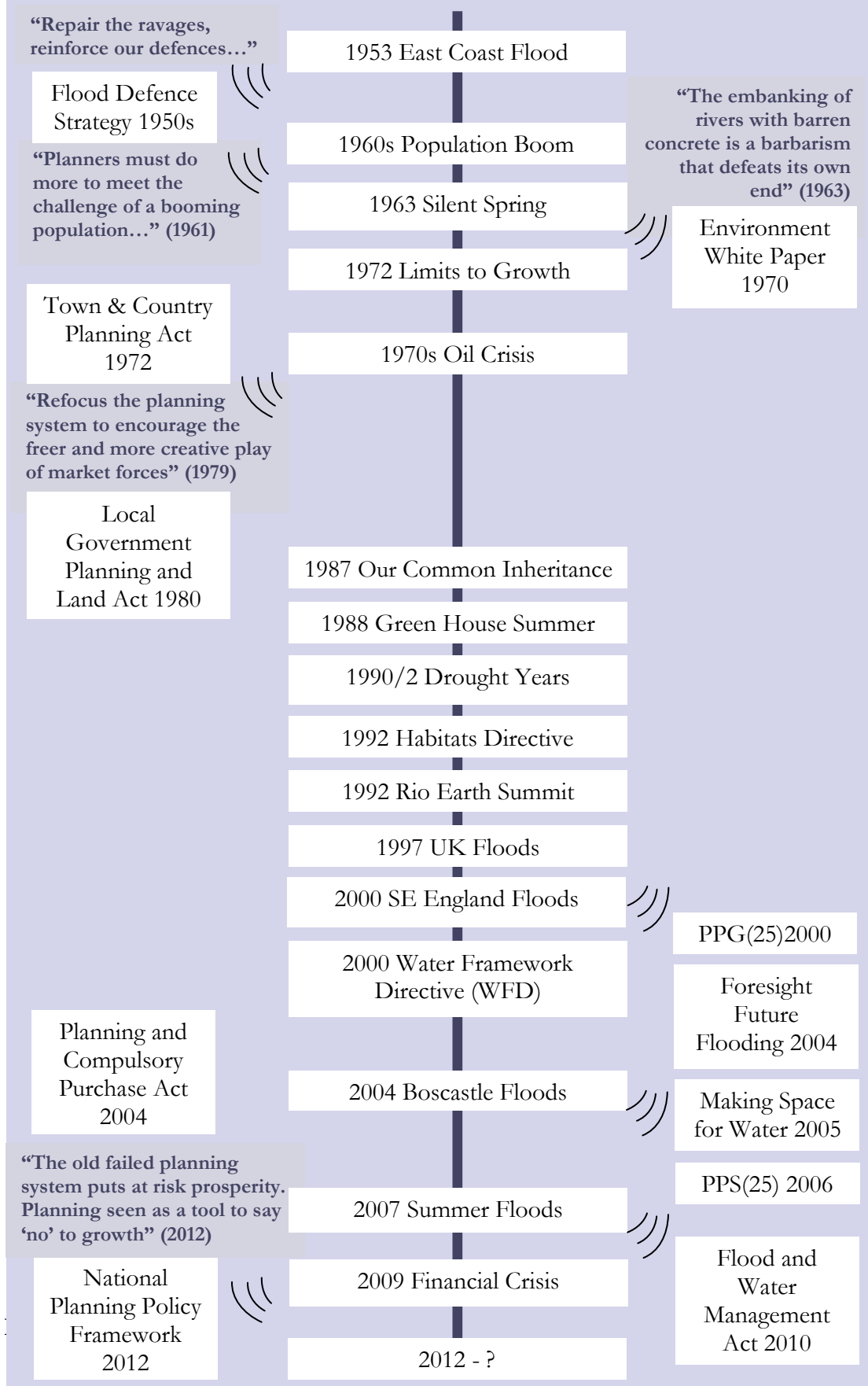


Table 7.3: Swings in Discourse by Disciplinary/Professional Background

Floodplain Dynamics		
Loss	Preservation	Restoration
<p>Bold – policy makers Normal - academics Italic – practitioner</p> <p>Black – engineering Blue – planning Green – natural science Orange – economics/business/land owner Red – media/politics Grey – other/not known</p>	<p>TCPA (Planning) - <i>All the riverside land, liable to flood [in Oxford], should be reserved so as to be kept entirely free from building.....(The Times, 1926)</i></p> <p>Neville Chamberlain (Business) - The wisdom of some prohibition against the building of dwelling houses on land liable to floods [in London] (The Times, 1928)</p> <p>CPRE - <i>the works of enlarging and straightening the river, now being carried out by the Thames conservancy...will merely result in increased volumes of water being brought more rapidly into the non-tidal river...it will constitute a grave danger</i>” (The Times, 1930)</p> <p>Berkshire Regional Planning Committee - <i>Oxford land falling below the 250ft contour should be kept free of any buildings other than those for agricultural purposes</i> (The Times, 1930)</p> <p>Thames Conservancy (Engineering) <i>Delineation of a flood zone on each side of the river Thames throughout its length... by far the cheapest and would have the great merit of leaving the river and countryside alone</i> (The Times, 1947)</p> <p>Surrey CC Hurst Park racecourse - <i>substantial and material departure from the county development plan...contrary to the council's policy of refusing to allow development on the floodplain of the Thames</i> (The Times, 1960b)</p> <p>Chief Engineer Conservancy Board - <i>this tendency, if allowed to increase unchecked, could eventually increase the flood levels to a disastrous extent</i> (The Times, 1960c)</p> <p>Ralph Gardiner (Ecologist) - <i>the cultivated landscapes, created out of the wild forests and swamps....urbanized society</i> (1963)</p>	<p>Patrick Abercrombie (Planning) - <i>To increase the capacity of the flood meadows.....As for those towns that suffer from floods, local protection.... could be planned and the precaution in clearance schemes taken not to rebuild below the danger line. I trust that the Minister of health has his eye upon this attack .....which is being made by these grandiose engineering schemes of the Catchment Boards</i> (The Times, 1934)</p> <p><i>The Times - Built up areas present a large and complex problem which, in all probability can eventually be solved only by removal of houses and businesses situated within them”</i> (The Times, 1951)</p> <p>Surrey County Council (Planning) - <i>ideal would be the complete clearance of the flood plains and washlands</i> (The Times, 1965)</p>
<p>ICE member (Engineering) - <i>otherwise good meadow or pasture land which are foul with rushes ...but which might be restored to haying, stock raising or dairying conditions if only the natural drainage arteries were conditioned to void the water in a sea ward direction</i> (The Times, 1930)</p> <p>Ministry of Agriculture - Land Drainage Act - the necessary machinery for securing that in future all the waterways and drainage channels in England and Wales could be kept in a proper state of efficiency (The Times, 1930)</p> <p>Viscount Swinton, House of Lords (Law) - Repair the ravages, reinforce our defences, and we would rebuild the houses and restore the land (The Times, 1953)</p> <p><i>Wates Ltd developers - Hurst Park racecourse (floodplain) to be developed as a residential area, as a substantial contribution to solving the housing problem</i> (The Times, 1960a)</p> <p>Charles Hill, Minister for Housing and Local Government (Medicine) - <i>planners must do more to meet the challenge of a booming population and a bursting economy.... planners must not be afraid to experiment</i> (The Times, 1961)</p> <p>Thames Conservancy (Engineering) - <i>prevent a repeat disaster of the 1968 river</i></p>		

<p><i>Mole flood disaster.... widen, deepen and straighten the channels, build new sluices and eight new bridges. The Times, 1971</i></p> <p><i>MAFF Chief Engineer - land drainage is the first function of a river (1973)</i></p> <p>Michael Heseltine (DoE) - radically recalibrate and refocus the planning system to encourage the freer and more creative play of market forces (DoE Press Notices, 1979)</p> <p><i>LGA (Planning)- local authorities should be pushing the provision of better flood defences way up the political agenda (The Times, 2001f)</i></p> <p><i>Ian Cluckie (Engineering) We need better flood defences (New Scientist, 2007)</i></p> <p>Yvette Cooper (Housing Minister) - Floodplains...no need to block [3 million] urgently needed new home by 2020 (The Times, 2007)</p> <p>Floodplain loss? - Eric Pickles (CLG) - Old failed planning system puts at risk prosperity. Planning seen as a tool to say 'no' to growth (BBC News, 2012)</p>	<p><i>Edmund Penning Rowsell and John Handmer (Geography) - no attempt at long-term flood hazard reduction can succeed without policies to control encroachment of vulnerable urban development into areas liable to flooding (1988)</i></p> <p><i>John Harman (Chair of EA) - the planning system provided the greatest opportunity to make sustainable choices for development in the future (The Times, 2000a)</i></p> <p><i>ABI - poor planning decisions will lead to.....homes becoming unsaleable, uninsurable and uninhabitable (The Times, 2008)</i></p>	<p><i>Ver Valley Society - We want to see the water table and the wetland habitats of springs, ponds and wet meadows that are part of our heritage, fully restored and preserved (The Times, 1992)</i></p> <p><i>Oliver Tickell (Journalist) - veto over such flood plain developments and the money to buy up and destroy development that should never have been allowed (The Times, 1994)</i></p> <p><i>Colin Thorne (Geomorphologist) - seek to retain and enhance the natural forms...of the river (1996)</i></p> <p><i>Simon Lyster (WWT) - encourage wetland restoration on flood plains instead of building on flood plains and ...hard engineering (The Times, 2000d).</i></p> <p><i>Adams et al (Geography) - increasing the flood storage capacity of the floodplain and helping prevent serious flooding downstream (2004)</i></p> <p><i>David Balmforth (Engineer) in the more extreme cases, managed retreat may prove to be the only viable option (The Times, 2007)</i></p> <p><i>Colin Thorne (Geomorphologist) – making space for water through reconnecting rivers to their natural floodplains and wetlands wherever possible (The Times, 2009f)</i></p> <p><i>ABI - We need blue ribbons through cities....it won't happen overnight, it will take 20 years or more (G10/3)</i></p> <p><i>Chris Spray (WWT) - A more intelligent and sustainable use of wetlands in urban and rural contexts... (The Times, 2012)</i></p>
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The ecologist Ralph Gardiner (1963), for example, viewed the embanking of rivers “with barren concrete is a barbarism that defeats its own end” (section 4.6). The economic slowdown in the late 1970s, linked to the oil crisis, is attributed to lie behind the loss of radicalism within the environmental movement. In the heart of the recession, environmental issues “suddenly lost out” with the competing concerns of inflation and mass unemployment (Hajer, 1997). It could be viewed that in order to maintain a social credibility, the wider environmental discourse had to find a way to reconcile environmentalism with economic restructuring. Thus the new ‘positive-sum game format’ of sustainable development (going against the original concerns of the environmental movement), reduced many of the objections governments might have had to a new approach of environmental regulation (ibid). Sustainable development, a form of political ‘ecological’ modernisation, led to the opening up of existing state policy-making practices, with the creation of new participatory practices with a shared goal to meet the fundamental needs of present and future generations, while preserving the life-supporting systems of nature (Novotny *et al.*, 2010). Sustainable development, in a break from the radical environmentalists’ (conversationalists’) agenda of ‘limits’ and ‘survival’, also meant a new role for science, which increasingly “became entangled in the centre of the process of policy-making” (Hajer, 1997). Nature indeed reinforced the need for ‘sustainable development’, in the immediate years following the Brundtland Report ‘Our Common Inheritance’ (1987), dealing the green house summer of 1988, followed by the drought years of 1990 and 1992, in which the media lamented southern England’s dying rivers; “*From the Wallop Brook in Hampshire to the Little Ouse in the Fens, streams whose names evoke the well-watered countryside of times past are drying up and disappearing*” (The Times, 1992). Climate change thereafter arrived in the political mainstream. Both National and European legislation was adopted within a political context receptive to sustainable development, with the EIA and Habitats Directive of 1988 and 1992.

Shock flood events hit the country in the late 1990s and turn of the century, prompting John Prescott’s ‘wake up call’ for everybody. In July 2002, under pressure from the insurance industry, the Government promised to accelerate the programme of building flood defences in response to growing concern about the impact of global warming, increasing spending on the defences to £150 million by 2005 (The Times, 2002d). However, in the same way as shock flood events in the 1950s, including the east coast storm, were used to justify flood defences for urban areas, contesting voices used the

shock events of the 1990s and turn of the century to construct their own novel discourse and ‘storyline’. The media bowed to reputation, with Prince Charles stating that the 2000 floods were a consequence of “*man’s arrogant disregard of the delicate balance of nature*” (The Times, 2000b). The perception of the poor functioning of the policy domain proved the dominant endogenous force of change, as documented in section 1.1, flood defences were pronounced to be inefficient (too expensive) and they lost political legitimacy, impacting on the hydrological and ecological integrity of entire watersheds. Moreover the damages from the more frequent and devastating flood events were directly attributed to flood defence and development policies. The EC Water Framework Directive came into force in 2000, and the Global Water Partnership gave greater prominence to Integrated Water Resource Management (IWRM). With a further timely ‘assist’ from nature, the consultation events for Defra’s ‘Making Space for Water’ were accompanied by the shock event of the Boscastle floods. It is important to note at this point, it was not existing actors with responsibilities for ‘flood defence’ who changed discourse position; it was new actors, natural scientists, waiting in the wings and unhappy over previous decades with the perceived ‘destruction’ of wetlands and river morphology, who influenced the ‘rewriting’ of policy, from controlling and defending against water, to a more holistic, strategic, multi-method and integrated approach to land and water management (Johnson *et al*, 2007). The engineering dominated sector became more responsive to ecological arguments campaigned for by third sector organisations, particularly the RSPB and National Trust, incumbent ecologists and geomorphologists working within the Environment Agency ‘mitigating’ against engineering schemes, together with a sympathetic media. With momentum growing for institutional change, the findings of the IPCC 2007 on climate change were again closely ensued by the shock events of the 2007 floods, leading to further strong recommendations for change in the Pitt Review (2008), and more fundamental legislative change in the Flood and Water Management Act of 2009.

The policy interest in floodplain protection and restoration can thus be seen as part of a longer term trend emerging from the re-framing of the environmental agenda from the late 1980s, yet intimately tied up with the economic agenda from its conception. The IPCC report and the Cumbrian floods of 2009, were however over shadowed by another ‘act of war’ on the “*soggy floodplain of global finance*” (section 6.5). The “*financial refugees*” in the economy, suffering from the “*worst financial crisis since the Great Depression*”

have since taken precedence in political circles from 2009 to date. ‘Flood defence’ budgets have been cut, but the ‘crisis’ has perhaps exacted the strongest change on floodplain restoration through the adjacent policy arrangement of planning.

The Adjacent Arrangement of Planning

In 2006, Alan Werrity wrote that the “wise avoidance of floodplains for settlement broke down in the 1930’s and 1940’s” (p17). This is not such a simplistic picture and the historical discourse analysis delivered surprising findings in chapter 4. Against claims to the contrary by contemporary authors, early planners were extremely resistant to early floodplain encroachment. They framed policy to prohibit development, with early examples of ‘green belt’ marking out areas susceptible to flooding. Planners also predated natural scientists, in their wish to restore naturally functioning floodplains, including Sir Patrick Abercrombie in the 1930s (section 4.10). Yet what could be termed a shock event, the post war baby boom of the 1960s, took precedence as planners faced calls from the Minister for Housing and Local Government to “*do more to meet the challenge of a booming population and a bursting economy....planners must not be afraid to experiment*”. Local government was reorganised to provide a more efficient machine for development, the Town and Country Planning Act 1971 aimed to intensify and streamline economic growth, followed by ever intensive lobbying by Developer interest groups. Following the oil crisis and deep recession of the late 1970s, the Conservative Government looked to “*reduce bureaucratic obstacles to the freer working of markets*” in the early 1980s and “*radically recalibrate and refocus the planning system to encourage the freer and more creative play of market forces*” to by-pass local authority ‘obstructionism’. In the flood events of the 1990s, the media began to draw attention to the “*aggressive process of urbanisation*” that had “*ripped across the newly civilised flood plains*” following the agricultural drainage schemes (The Times, 1994). The floods that affected the country in the 1990s and turn of the century did prompt the relationship between land use (urban and rural) and flooding to be explored in the 2004 Foresight Future Flooding project (Evans *et al.*, 2004). Defra’s Making Space for Water strategy was to be embedded in planning (Defra, 2004). However, from the Planning and Compulsory Purchase Act of 2004 to 2012, the structure of English planning has witnessed a “breathtaking pace of change” (Cowell and Owens, 2010, p954). The final years of New Labour saw further steps to concentrate the institutions of regional planning on economic development goals, albeit charging the new ‘spatial planning’ system with the delivery of sustainable development.

Following the summer floods of 2007, it was again apparent that the housing agenda took precedence, as the housing minister claimed “*the waters inundating swaths of central and western England [were] no reason to block urgently needed new homes, including developments built on flood plains*” (The Guardian, 2007). As the financial crisis deepened, the Conservative/Liberal Democrat coalition government elected in May 2010, backed by the political lobbying of house builders and developers, have announced planning reform as key to England’s economic recovery and planning a tool for economic growth. In successive measures to role back “*red tape*” and get “*planners off our back*” the coalition government have announced the delivery of 75,000 new homes “*in an attempt to reverse the chronic shortage of housing and boost the flagging economy*” (The Times, 2012).

Whereas Wiering and Crabbé (2006) see the effect of developments in adjacent policy arrangements as a ‘force for change’ on the arrangement under consideration (floodplain restoration), it can be seen that an adjacent policy arrangement brings its own set of ‘forces for change’ (see figure 7.5).

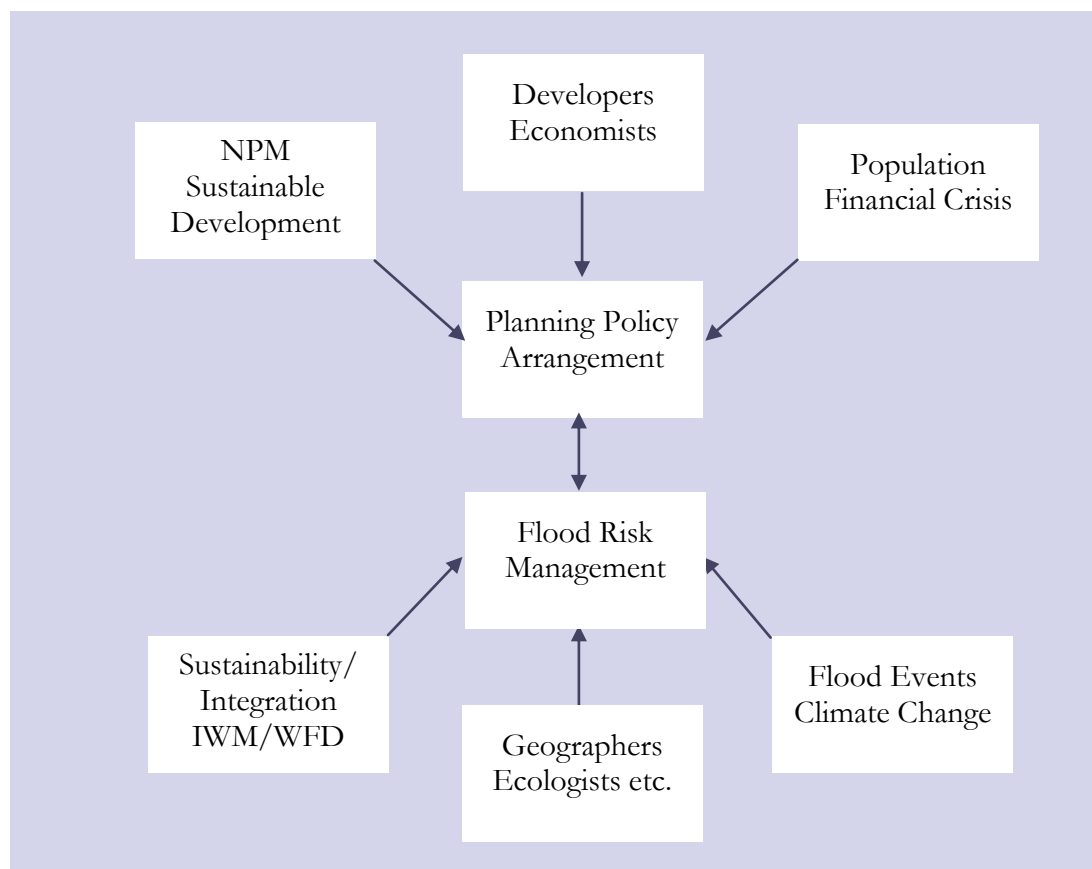


Figure 7.5: The Adjacent Policy Arrangements of Planning and Flood Risk Management - Stagnating Floodplain Restoration

In this case, it would appear that the financial crisis as a shock event is a far more potent force for change, with pro-development changes in the planning arrangement backed by the Treasury evident in the radical restructuring of planning policy; the ‘streamlined’ National Planning Policy Framework (2012).

7.3 Governmental Actors

The thesis has illuminated hidden assumptions and implicit commitments in flood risk management, and generated insights into two competing discourses that have locked horns for over eight decades. The research on the floodplain restoration policy implantation deficit has validated Hajer’s work in that there are major problems involved in reaching a consensus, in the complex and multi-faceted environmental policy field. As the historical discourse has illustrated, the actors construct their arguments around flood risk management so differently, there is a fundamental problem in reaching any agreement about the very nature of the problem. Validating previous work by social constructionists, the research has shown that biologists, ecologists, planners, hydrologists and engineers have very different modes of reason, conceptions of science and how it is practiced, which leads to fundamental disagreements. “The idea that ‘science is science’ and that all scientists, using the scientific method, can come to reasonable consensus has proved to be erroneous” (Fischer, 2003, p110), as Hajer has sardonically added “even when working for the same employer” (in Fischer, 2003, p110) as has clearly been seen within the Environment Agency. Two key barriers have emerged from the interpretative research; 1) engineers have a monopoly on knowledge claims applying their élitist and techno-corporatist tendencies within flood risk management decision making, maintaining power over the arrangement; 2) despite being an (the) early advocate of floodplain restoration and preservation (see table 7.3), the planner appears to have switched sides, aligned with the economic discourse on growth. A vital actor is thus absent from the counter coalition. Section 7.3 will undertake a closer examination of these two governmental structures.

Flood ‘Defence’ Actors

As chapter 4 detailed, the Land Drainage Act 1930 created a new system of grant aid for new capital works was created overseen by the Ministry of Agriculture. The Act created

47 *Catchment Boards* with powers to levy local governments and permissive powers to carry out 'arterial drainage' (flood defence engineering works), on main rivers. Internal Drainage Boards (IDBs) were given powers to levy rates and permissive powers to enter land and carry out works on smaller rivers and drains, local authorities were given powers to deal with other non-main rivers outside the wet lowland districts. The 47 catchment boards set up under the Land Drainage Act, 1930, were amalgamated into 31 *River Boards* under the River Boards Act, 1948 with powers for land drainage and flood control, river pollution prevention, the maintenance and improvement of fresh water fisheries and, in a few cases, the maintenance of inland navigation (Fish, 1970). The 31 River Authorities were replaced by 10 *Water Authorities* under the Water Act 1973 with complete executive responsibility for all water provisions in their areas. These matters fell under the remit of the newly created Department of the Environment (DOE). However, a separate decision-making structure within the River Authorities, independent and remaining under MAFF control, 're-created' the decision-making autonomy of the original Catchment Boards/River Boards in the form of *Land Drainage Committees* (Scrase, 2005). Under the Conservative government's plans for the privatisation of the water industry in the 1980s, flood alleviation and land drainage were kept separate from the newly privatised Water Service Companies (responsible for water supply and sewage), despite conjecture regarding the loss of MAFF's powers (Penning Rowsell and Handmer, 1988). Under the 'National Rivers Authority' (NRA) (also responsible for environmental regulation), funds for land drainage and flood defence remained ring-fenced and the Land Drainage Committees, to operate under the NRA, were renamed *Regional Flood Defence Committees*. Under the Land Drainage Act 1991, the Ministry of Agriculture, Fisheries and Food (MAFF) retained overall policy responsibility for flood defence in England. The Ministry had two key roles relating to flood defences: to establish the policy framework within which organisations carried out defence, drainage works and maintenance; and to provide government grants for 'cost effective' capital flood 'defence'. The National Rivers Authority (NRA), through the Flood Defence Committees, undertook measures to reduce the risks of flooding from designated main rivers and also exercised general supervision over all matters relating to flood defence. Drainage boards continued to carry out measures in respect of inland flooding, in specified districts with special drainage needs. Local Authorities retained the responsibility to undertake flood defence works where they were not the responsibility of the NRA or IDBs. At this point in time Penning Rowsell and

Handmer (1988) believed that in “*this interplay of political forces what should not be underestimated is the power of vested interests in the administration of flood alleviation*” (p217). In response to the call for a more ‘integrated’, ‘strategic’ approach, in 1995 the NRA merged with Her Majesty’s Inspectorate of Pollution and the waste authorities, to promote ‘integrated’ environmental regulation across water, air and land in the newly formed ‘Environment Agency and Environment Agency Wales’ (EAEW). EAEW was given a general duty to promote ‘sustainable development’. Yet again institutional arrangements for land drainage and flood defence were left largely unchanged, the Association of Drainage Authorities argued successfully for ‘the *Flood Defence Committees*’ to retain their executive powers and for flood defence funding to be ring-fenced for that exclusive purpose (ADA, 1995: 11). Flood ‘defence’ measures continued to be implemented at a regional and local level by flood defence committees, internal drainage boards and local authorities (Scrase and Sheate, 2005). From 1993 MAFF’s official aim of flood defence policy had however shifted from rural to urban priorities, “*to reduce risks to people and the developed and natural environment from flooding and coastal erosion by encouraging the provision of adequate, technically, environmentally and economically sound and sustainable flood and coastal defence measures*”. The new emphasis on reducing flood risk to people was reflected in the prioritisation of objectives as follows: flood warning systems; urban coast defence; rural coastal defence; existing rural flood defence and land drainage schemes; and new rural schemes with the lowest priority.

The actors, in the form of flood defence committees (former land drainage committees, river boards and catchment boards), IDBs and local authorities, had now remained intact from the Land Drainage Act of 1930 under the oversight of MAFF (former Ministry of Agriculture). MAFF was replaced in 2001, by the Department for Agriculture, Food and Rural Affairs (Defra), responsible for the existing policy framework, strategic guidance and legislation for flood management and water resources in England. Following the extensive floods across England in the summer of 2007, the Pitt Review (2008) highlighted that the authorities responsible for managing flood risk “should co-operate better” (EA, 2011). The Flood and Water Management Act 2010 has identified “new responsibilities” for flood risk management authorities with a “duty of cooperation” between all relevant authorities (*ibid*). Defra remains the lead government department and develops flood risk management policy. Under Pitt’s recommendation, the EA has been given the strategic overview for flood risk

management, also responsible for flood risk management activities on main rivers. ‘Lead local flood authorities’ (LLFAs), working closely with ‘Regional Flood and Coastal Committees’ (RFCCs), prepare and maintain a strategy for local flood risk management and how it will be managed in ‘partnership’ in their areas, which includes the establishment of a ‘SuDs approval body’. District councils and Internal Drainage Boards (IDBs) supervise land drainage, and flood defence works on ordinary watercourses or other sources of flooding. The Act provides for the ‘replacement’ of existing Regional Flood Defence Committees with the ‘*Regional Flood and Coastal Committees*’ (RFCCs), who “have a key role in the co-ordination of FCERM by advising on and approving the implementation of programmes of work for their areas, and supporting the development of funding for local priority projects and works. RFCCs also provide for local democratic input through the majority membership of representatives from Lead Local Flood Authorities”. It is also intended that they will also have a wider role in assisting the scrutiny of local authority risk assessments, maps and plans required by the EU Floods Directive.

Table 7.4: Actors and Duties in Flood Defence/Risk Management; 1930 and 2010

1930 LAND DRAINAGE ACT		2010 FLOOD AND WATER MANAGEMENT ACT
Duties		
National		
Ministry of Agriculture (MA)	Strategic lead and funding delivery	Department of Environment, Food and Rural Affairs (Defra)/ Environment Agency
Regional/Local		
Catchment Boards	Flood defence (risk management) on main rivers	Regional Flood and Coastal Committees
Internal Drainage Boards (IDB)	Flood defence on ordinary watercourses and land drainage	Internal Drainage Boards
Local Authorities	Flood defence on ordinary watercourses and land drainage outside IDB area	Local Authorities
	Partnership strategy for local flood risk management/ SuDs approval body	Lead Local Flood Authority

Thus a new ‘actor’ has joined the scene of flood risk management, in the form of ‘Lead local flood authorities’. The new Act calls for interactions between the different

governmental actors to be intensified, through the duty to co-operate. Yet, the new authority will be working closely with the ‘new’ Regional Flood and Coastal Committee (i.e. the Flood Defence Committee), in the remaining institutional structure that has now remained largely intact for over eight decades. Table 7.4 reveals despite the change in names, the original actors and duties persist.

Flood risk management (i.e. flood defence) has had a stable history, which it could be argued, explains the hegemonic discourse of ‘flood defence’. This is evident in the parent department’s history. In stark contrast, planning has undergone five departmental changes, which perhaps does not aid the planning professional’s *raison d’être* and skill set in flood risk management.

Planning Change vs Flood Defence Stability

The Ministry of Housing and Local Government (encompassing planning) joined the Ministries of Transport, Public Building and Works in 1970 to form the Department of the Environment (DoE). (Transport became a single department in 1976.) Thus housing and planning sat within the DoE’s mixed portfolio, alongside environmental protection. In 1997, the DoE was again merged with the Department of Transport to form the Department of the Environment, Transport and the Regions (DETR). Allegedly due to the BSE crisis, the DoE’s responsibility for environmental protection was merged with the Ministry of Agriculture, Fisheries and Food (MAFF) to form the Department for Environment, Food and Rural Affairs (Defra) in 2001. Housing and planning, along with transport, local and regional government aspects formed the new Department for Transport, Local Government and the Regions (DTRL), but just a year later transport again became a single department, the remaining portfolio forming the Office of the Deputy Prime Minister (ODPM). The Department for Communities and Local Government (DCLG) succeeded the Office of the Deputy Prime Minister in 2006. Figure 7.5 details the successive changes in government departments.

Defra was given the overarching aim of sustainable development. Whilst the Secretary of State for Defra, David Miliband, wrote to the Prime Minister outlining his department’s mission as “enabling a move toward what the World Wildlife Fund has called One Planet Living” (a concept that described the challenge to live within the environmental limits of the Earth), Ruth Kelly (Economist) was named first Secretary

of State of DCLG, soon to form the Homes and Communities Agency with an inexorable drive for affordable housing. Planning was now part of a portfolio including housing; building regulations; community cohesion; race equality; community resilience; local government; urban regeneration and the Thames Gateway. Despite many laudable social issues in which planning could play a key integrating role, the drive for affordable housing (floodplain or not) seen in the late term of the Labour Government, perhaps marks the loss of environmental protection as a departmental ‘bed fellow’. Moreover, what is also blatantly apparent from figure 7.6, planning and flood risk management have remained on parallel tracks, never converging throughout their history.

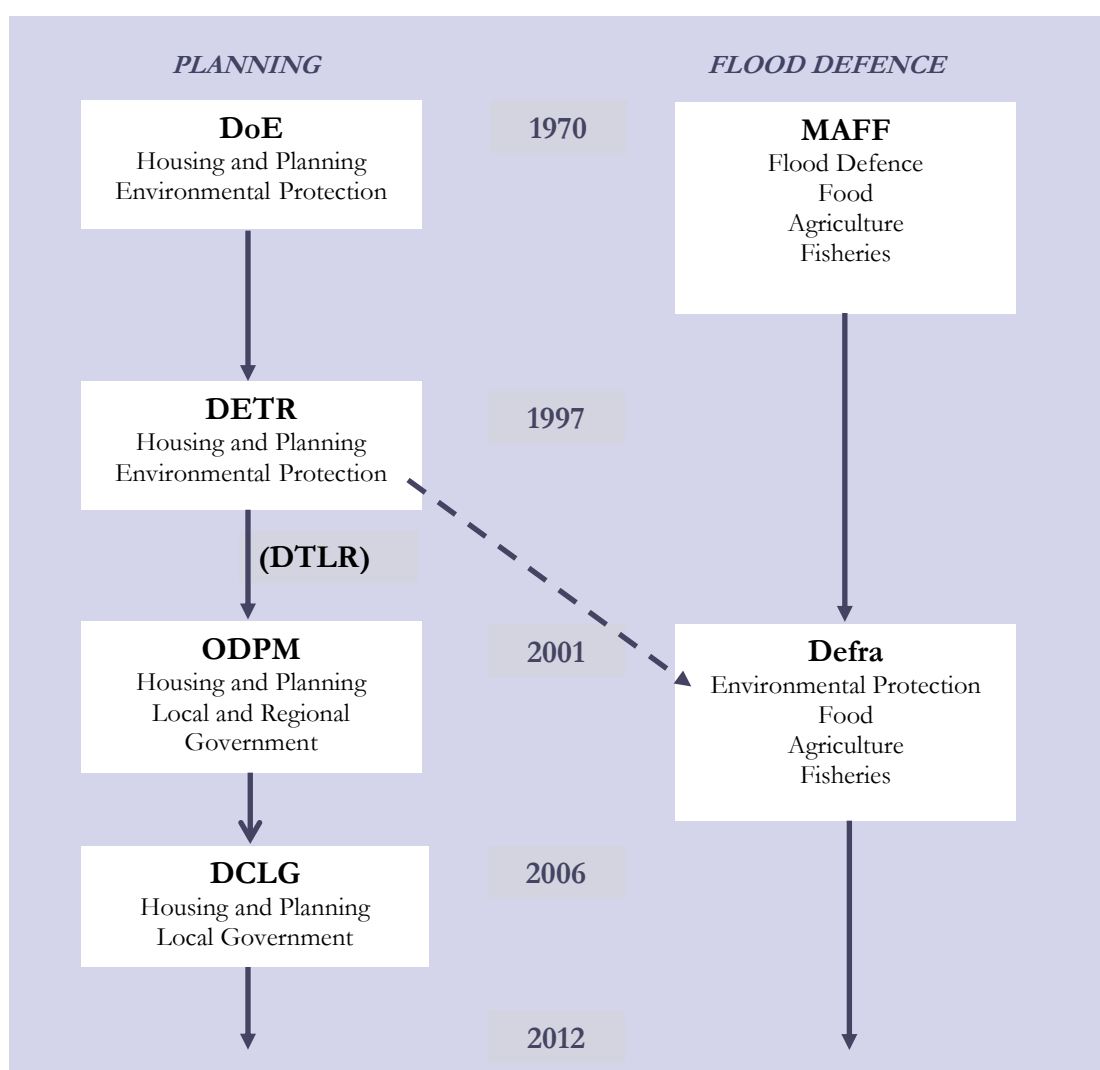


Figure 7.6: Governmental Department Changes; Planning and Flood Defence

Chapter 5 (section 5.7) detailed a senior EA water manager’s view that the lack of integration between land use and floodplain restoration stemmed from the top, in the “*unilateral, short-term planning and the lack of coordination*” between DEFRA and the

Department of Transport, Local Government, and the Regions (DTLR), who considered themselves as “*mutually exclusive*” to each other. Both ministries had developed policies that were only relevant to their own departmental remit (Shih and Nicholls, 2007, p1529). Table 7.5 summarises land use change from 1989 to 2010; the percentage of new dwellings built within areas of high flood risk by government region.

Table 7.5: Percentage of New Dwellings Built Within Areas of High Flood Risk by Government Region

Year	Government Office Regions									
	North East	North West	Yorkshire and the Humber	East Midlands	West Midlands	East of England	London	South East	South West	England
1989	1	4	11	13	3	7	17	8	7	8
1990	1	4	13	12	2	6	16	7	6	7
1991	2	3	15	8	5	4	13	5	5	7
1992	5	3	11	7	4	5	19	6	7	7
1993	1	4	10	12	4	4	15	6	5	7
1994	2	4	10	9	4	5	17	6	8	7
1995	4	3	11	10	3	5	21	6	7	8
1996	2	2	9	10	4	4	25	5	7	7
1997	3	2	9	11	4	7	24	6	9	8
1998	1	3	6	4	4	5	23	7	7	7
1999	2	3	9	7	4	6	24	7	8	8
2000	1	5	11	9	2	6	22	7	8	8
2001	2	5	11	10	3	5	18	7	9	8
2002	2	4	11	12	3	7	20	6	11	9
2003	2	5	12	11	2	7	28	7	8	9
2004	1	3	9	11	4	7	27	6	7	9
2005	1	5	12	9	3	8	15	6	8	8
2006	1	4	15	12	4	9	19	8	7	9
2007	2	6	14	12	5	6	16	5	5	8
2008	3	2	14	10	4	5	23	5	7	9
2009	1	3	10	10	3	10	21	9	8	11
2010	2	8	11	7	4	4	21	5	7	9

Notes:

The data in the table above are based on records received from Ordnance Survey up to March 2011. Comparisons between regions are affected by the varying proportions of areas of high flood risk in each region.

Source: Land Use Change Statistics

Following two decades of institutional dynamics in the flood risk management policy arrangement, the national level percentage of new dwellings built within areas of high flood risk has been largely static (mean 8.1 percent).

7.4 Meeting the Aim and Prognosis for Floodplain Restoration

The emerging, integrated, and more sustainable solution of floodplain restoration has not become a 'mainstream practice' for water managers and spatial planners to date. The 'window of opportunity' was unable to be taken following recent policy shifts and the catastrophic summer floods of 2007. In the excerpts from his speech in 2007 (p2), Miliband questioned where power and responsibility should lie in improving our ecosystem services, believing that Government could only help to spark a debate, but if we were to achieve a more mature, engaged debate, a broad 'coalition of interests', from citizens and community groups to farmers, developers and local government, *must* be mobilised. I propose it is 'government' agencies that are solidified in their approach to flood 'defence', and it is these same agencies that currently prevent the new coalitions from institutionalising floodplain restoration. A financial discursive event has 'hijacked' the discourse on sustainability. The economic discourse proves a strong counteracting force for change, against floodplain restoration, exerted through the adjacent policy arrangement of the planning system. The 'potent force' for floodplain restoration, natural scientists, desire the flood defence budget to meet their ecological objectives, yet are locked in the search for more evidence that floodplain restoration for flood risk management 'works', constrained by technocratic engineering ideologies. A 'begrudging' but stable alliance between the Environment Agency's flood defence committees and the planning system remain focused on keeping water and land separate in the 'battle against water' to protect unwise development that has, and continues to, encroach upon the floodplains. The links between planning processes and the environmental sustainability of major areas of public policy, Cowell and Owens (2006) argue are of considerable importance but have attracted rather limited attention to date; policy analysts "have tended to neglect the systemic implications of land-use planning when assessing institutional capacities for change" (p403). Far from a force for change to facilitate urban floodplain restoration, the planning system is unproven as of yet, in effectively stemming further floodplain loss.

Ungar (1992) observes that attention to the environment is episodic, and follows an “issue-attention cycle”. He contends that environmental attention peaks cannot be explained by elite manipulation, but rather the factors creating attention bursts include sustained periods of economic expansion, which magnifies growth’s environmental impact; relative prosperity, which provides leeway for environmental regulation; a sense of ‘social limits’ to growth; and the alarm dramatic events create. In effect, Ungar claims that “these factors afford an extra-media context that can affect both claims-making activities and the extent to which public arenas attend to and ultimately honour them”. We have witnessed this in the 1960s (following population growth) and the 1980s (following the oil crisis of the late 1970s). Floodplain restoration in urban areas (and the renewed credibility of the planning system) awaits then, ironically, the economic recovery and the unleashing of the next wave of development on the floodplain. If environmental claims makers can effect a sense of ‘social limits’ to growth, then these environmental claims would be most likely to be honoured if they can “piggyback on dramatic real-world events” (p484). In which case, an assist for floodplain restoration would also unfortunately rely again on the perfect timing of nature, with the next shock flood event. The growing backlash can already be seen growing in the closing sections of chapter 6, with the ‘usual suspects’ from the 1970s and 80s becoming more vocal in the media (including the RSPB, National Trust, Wildlife Trusts). The issue-attention cycle could be coming around again? Chapter 8, will however, consider prescriptions and recommendations before such an event.

8

Under the Surface of Water Management: Reflections & Prescriptions

What need is there, the British ask, for all that theorising about issues which require common sense? And why do scientists have to use such dreadful, obfuscating jargon in doing so?

The Independent, August 22, 1990

The final chapter will shine a light from an ‘interpretative’ angle, or get under the surface of water management, to address barriers quoted by academics, policy makers and practitioners, across the disciplines in the course of the research. Does the theoretical framework of institutionalism, political modernisation and discourse analysis offer any explanatory power and add useful insight to the floodplain restoration implementation deficit? Can this approach and framework add to the dialogue to generate or facilitate change in the policy arrangement? If so how? After reflecting upon the value of interpretative research in section 8.1, section 8.2 summaries policy arrangement prescriptions and recommendations. Section 8.3 presents plans for the research dissemination and continuation. Chapter 8 answers research question 5 - how and why is social science research of value in the integration of flood risk management and planning, in closing the implementation deficit for floodplain restoration?

8.1 Unveiling the ‘Myth of the Given’

Sir Howard Newby⁵ made an influential lecture in 1991 to mark the 40th anniversary of the UK Economic and Social Research Council (ESRC), the organisation of which he then chaired and the organisation that has kindly funded this PhD research. He made two key points regarding the relationship between the social sciences and the environment, firstly, “environmental change is as much a social science as a natural science issue” and secondly, “the slender contribution of sociologists to the study of the environment has been, to put it mildly, disappointing” (Newby, 1991, in Urwin, 2001, pvi). In the 80s and 90s, when the ‘environmental conflict’ was new, researchers agreed that the issue of environmental decline deserved more attention, yet the new environmental policies did not marry up to social expectations (Hajer, 1997). At this time social constructivist views, although rarely in the mainstream literature, started to make a contribution to political science in exposing the political conflict hidden in the question of ‘what definition’ was given to environmental problems of the era, including nuclear waste disposal and acid rain (Berger and Luckmann 1984; Douglas 1982, 1987; Giddens 1979, 1984; Hajer 1997). Sociological accounts grew from the 1990s, the sociology of scientific knowledge and the ‘risk society’ challenging the divide between the social from the natural, or the sociological from the scientific (Beck, 1992, Dickens 1992, Haraway 1991 and Latour 1992 in Urwin, 2001). Earlier this century, the ecologist Ehrlich believed the seriousness of the environmental dimensions of the human predicament were still unknown to the vast majority of decision makers worldwide; “although scientists understand the general directions in which humanity should be moving to solve its environmental problems, the policy response of society remains pathetic” (p31). Ehrlich (2003) thought there was still a clear need to recruit many social scientists to collaborate with environmental scientists and join the “quest for sustainability”. Such interdisciplinary collaborations were seen to have the potential to improve society’s response and trajectory through a better understanding of human behavior, including, from an ecologist’s viewpoint; “humanity’s treatment of its life support systems” (*ibid*). The called for collapse of the established dualities between the disciplines, Alan Urwin (2001) also believed, had important consequences for our understanding of the environmental crisis.

⁵ Sociologist and current Vice-Chancellor of the University of Liverpool (2008-to date)

Cracking the Codes

My research journey began on the basis of a perceived policy implementation deficit in floodplain restoration encountered whilst attempting, unsuccessfully, to implement a scheme ‘in partnership’ as an environmental planning practitioner. The fact the implementation deficit existed was subsequently verified by opinions and evidence in the natural science literature, so fortunately I was able to draw the conclusion that it was not due to poor planning professionalism. Rather than follow the path indicated and followed by my natural scientist contemporaries in investigating the deficit, instead, as advised by Silverman (1993) I believed; “if field research has anything to offer, its theoretical imperatives drive it in a direction which can offer participants new perspectives on their problems”. Silverman maintains that “paradoxically, by refusing to begin from a common conception of what is ‘wrong’ in a setting, we may be most able to contribute to the identification of what is going on, thereby, how it may be modified in the pursuit of desired ends” (Silverman, 1993). Taking on more than rationally defined barriers, the thesis has tackled the strong institutionalised barriers to floodplain restoration, constructed in layers over many decades. Recognising the contribution, and potential, of recent interpretivist ‘non-mainstream’ studies, my policy analysis departed from the prevailing ‘rational’ models of policy inquiry and directed attention to the aspects of policymaking that were playing out on the floodplains of England, which are currently overlooked by all actors in the domain. Or as Fischer (2003) terms the situation; “obscured by the ‘myth of the given’” (p15).

The thesis has verified the interpretivist researcher’s view, that it is useful to see the environmental flood risk ‘problem’ as a social phenomenon. Following academic authors, including Frank Fischer, Marteen Hajer and Hendrik Wagenaar from the US and the Netherlands, the thesis has revealed the political bias present in the flood risk management policy arrangement and adjacent arrangement of planning. As has been revealed by Hajer and Wagenaar (2003), in other environmental and social policy arenas, the so called neutral methods of scientific, evidence based policy analysis to generate ‘optimal and rational solutions’ make strong presuppositions, and are part of a particular institutional order in which political and economic elites seek “to design economically efficient and technologically efficacious solutions to what they perceive as society’s problems” (Hajer and Wagenaar, 2003, pxiii). Although the various actors in the policy

arrangements, across the disciplines, hold varying perceptions of what the flood risk ‘problem’ and solution is, those with the power in the two arrangements impose their interpretation onto the rest of the actors. The use of interpretive methods have probed for the presuppositions that “discursively structure” our social perceptions of flood risk management and floodplain development; what we consider to be ‘fact’, ‘normal’ and ‘expected’ in our solutions (Fischer, 2003, p15). Those holding power are able to “designate what is considered a legitimate political argument in political discourse.....and, ultimately, what kind of society we envision ourselves living in” (Hajer and Wagenaar, p13). This includes homes at risk on floodplains. Grounded in the interpretive orientation, rather than searching for the truth as to whether floodplain restoration ‘works’ or what traditional policy responses are required, my analysis of the discursive social constructions of the political actors and policy institutions has uncovered that it is the different discourses and definitions of the ‘problem’ that anchor the current policy prescriptions (*ibid*). Following Fischer (2003), it can be said that it is ‘merely’ language that plays a crucial role in framing the contextual contours of argumentation, as the normative presuppositions of those in power operate below the surface of water management and planning. These assumptions shape methodological commitments, disciplinary practices and hence our policy alternatives and thus delimit our choice and range of decisions and policy solutions (*ibid*).

Staying with language, Nigel Gilbert (2001) believes that sociologists “seem to have their own special language for talking to each other, like a secret code, replete with Masonic mental handshakes, that has to be cracked before you can understand any of their messages. Sometimes this secret code appears to follow the rule, ‘don’t use one syllable when twenty will do’”. (Incidentally, Gilbert read for his first degree in Engineering, before being “lured into sociology” (Gilbert, 2012). He might also have observed, as myself, that engineers also have their own special language for talking to each other, with the secret code that appears to follow the rule, ‘why use any syllables or words at all, when a model or equation will do’?) In recognising and advocating the deeper interpretive role of the cultural and ‘institutionalised’ context underlying flood risk management policy, it was not my intention to reject or dismiss the rational, scientific endeavour. It was to complement and shine a light on the problem from an alternative angle, as Nigel Gilbert (1997) explains, “by shifting theoretical perspective, just like a kaleidoscope the world under investigation changes shape. Different theories bring

different aspects of the world into view”. Or to put it another way, I want to get under the surface of the policy implementation deficit in water management. In articles and conference papers to date, I have unwittingly taken on the role of learning the different ‘languages’ of the disciplines and to mediate between them (now recognising my ‘mother tongue’ stems from the biological sciences). “We have a dichotomous understanding, one based on science, the other on social theory. So, while social theory can certainly continue to make major contributions, the danger is that it will continue to do so within its comparatively watertight disciplinary compartments” (Dickens, 1992, p2 in Urwin, p10). I obviously am not a fan of watertight compartments, so what are the implications of the PhD research, in words of as few syllables as possible, for interdisciplinary partnership working towards integrated, sustainable (original 1980’s version) water management and the restoration of urban floodplains?

8.2 Non-Watertight Prescriptions and Recommendations

At the least, I trust the research findings can be used to redefine some of the perceived barriers to urban floodplain restoration, to allow for greater sophistication in analysing competing definitions, contestable findings, questionable explanations, contentious arguments and rhetorical approaches from alternative discourse coalitions. In particular from the economists and engineers currently ‘in power’ over the policy dispute between traditional and ‘natural’ approaches to flood risk management, and the loss of further floodplains and wetlands to ‘economic growth’ and development. I also hope the research allows for a greater understanding of the planner’s dilemma, and the difference between the ‘planner’ and the government level ‘planning system’, when statements such as the following are common in contemporary literature; “successive governments have been seeking ways of controlling urban development on floodplains since the 1940s (see DoE *et al.* 1982 1992) (Johnson *et al.*, 2007). According to Fischer (2003), in policy analysis, we can ask which of our institutional commitments have to be respected, which of our social conditions are malleable and which are fixed?” There are thus four sets of recommendations and prescriptions to address Fischer’s categories: a change in current institutional structures; simply ‘talking more’; aligning discourses and the need for ‘policy diffusion’ (best practice and policy innovation from overseas).

Gaining Access to the 'Halls of Decision Making'

As Hajer (1997) states, the environmental dilemma of modern society will not go away; “Modern society will constantly have to renegotiate what behaviour is tolerable and what is not, what is ecologically and socially feasible and what is not. Yet it would be a great improvement if ecological politics could shed its prevailing techno-corporatist format and create open structures to determine what sort of nature and society we really want” (p294). Thus, the innovative approaches to flood risk management of floodplain restoration will call for “institutional practices that allow for the playing off against one another of different sorts of knowledge” that allows for productive inter-discursive debates (Hajer, 1997, p282). Yet the current institutional set up in flood risk management and planning, currently however, determines “not only who is allowed into the halls of decision-making” but “who is kept out” (Hajer and Wagenaar, 2003, p13). One informant described the *“peculiar power relationship from EA; they see themselves as a decision maker but want co delivery (not co decision maker). The EA should be the competent authority but need to improve”* (C10/8, Defra). There is a perceived secrecy of data and difficulties in sharing data between stakeholders and *“many bailiffs protecting the data”* (H09/3, Academic Geographer). As Hajer and Wagenaar (2003) have described, despite the ‘shifts in governance’ to partnership and cross sector integration, the realities of the political-institutional landscape mean that attempts at policy integration for floodplain restoration are “marred and constrained in both policy arrangements by power differentials and insidious, unrecognised biases in policy rhetoric and perception”.

The flood risk management institutional arrangement can be seen through discourse-theory as a continuous struggle for discursive hegemony and discourse-coalitions have been built based on their shared definition of reality. The power in the flood risk management policy arrangement (flood defence budget and decision making) is held by hydrologists and engineers who favour physical construction of flood-alleviation structures over non-structural approaches, such as floodplain restoration. Planning, although supposedly tasked with sustainable development, is currently dominated by economic interests, planning by appeal over ruling local interests. Mechanisms of planning are technical and instrumental, with goals for speed of delivery and objectives for high densities and brownfield use (Cowell and Owens, 2006); the *“90 day decision limit, does not allow for adequate negotiation of projects”*, there is *“no time for innovation”* and

“everybody is ‘busy, busy, busy’” (10/3, Planning Consultant).

Urban planning is understood by the US authors and water managers, Novotny and Ahern (2010), as the process for “discussing and deciding on collective goals and priorities, in order to accommodate present and future human needs, and to make decisions and institute policies that reduce uncertainty and risk” (p137). The existing built form of a city can be limiting or problematic, but through the urban planning and design process, policy and physical/spatial solutions can be articulated to address the problems (*ibid*). Hajer and Wagenaar (2003) note that a multitude of constraints characterise most policy situations. These situations or ‘conflicts’ are not usually definitively resolved, instead practical judgements are made and a workable definition found for the problem. Such deliberative, practical judgments emerge, not under new public management time limits, but “slowly, often tentatively and haltingly, through mutual inquiry and mutual discourse with others” (*ibid*, p23). When the issues are “rife with conflict” this deliberation must be open and democratic (*ibid*, p24). The planner, given the time to reflect, should in theory be ideally placed to deliver.

Hajer (1995) emphasises that reflexive institutional arrangements can therefore never be based on pre-conceived problem definitions, but instead should be orientated in a large part towards constructing the problem. Rather than the traditional exchange, translation or plain transfer of knowledge, instead the “truth, relevance and cogency of knowledge claims” should be transacted (Dunn 1993, in Hajer, 1995, p287). Whilst I realise quoting Foucault would not wash in a flood defence or council committee meeting, it is of interest that the theorist believed a reflexive application of science would start from the realisation that science does not produce truth but only truth claims (in Hajer, 1995). Hajer (1995) believes that “learning requires the invention of new types of reflexive institutions in which various actors meet and discourses can be pitted against one another” (p8). There is a vital need for a democratic balanced, multi-disciplinary membership (including ecologists, geomorphologists, geographers and planners) of the engineering dominated flood defence committees, yet only one observed actor throughout the research period called for a “*Reform of Internal Drainage Board membership, funding arrangements and duties*”. Whilst county and district level councillors are currently statutory members and “*relied on when taking decisions*” (A12/5 hydrologist) the majority of stakeholders lacked adequate training and regarded their own understanding of the

“scientific background to flood management totally inadequate for their roles”, the “displacement effects of flood plain development almost unknown” (ibid).

Deliberative Problem Solving

In applying the interpretative approach, the thesis has provided insight into the engineer's conception of how the scientific method should proceed (modelling and quantifying), which then leads to a certain conception of how flood risk management (i.e. defence and resilience) should proceed, within the engineer's understanding of how flood risk management should be organised and managed. The engineering discipline's justified belief and valid knowledge defines the limits to even the kinds of questions and information or data that is considered acceptable in the debate over flood risk management prescriptions. As with other environmental policy issues, the understanding of flood risk management is not fixed from the natural world, it is framed and fixed from the discourse of the actors in the domain (Fischer, 2003). As the various discourse coalitions work on the same flood risk 'problem', each coalition has constructed their own alternative view of the situation, or as Hannigan states (for environmental science in general), a better social construction of the evidence (Hannigan 1995 in Fischer, 2003). Fischer (2003) explains how the social constructionist approach reveals that in policy debates it is often deeper social and cultural factors, and not the 'facts' of the arguments, that can play the decisive role in the assessment of competing views. By assigning numbers to decision-making criteria, it offers what appears to be definitive answers to political questions and thereby a deceptive appearance of truth (*ibid*). In the engineering realm, flood risk alleviation is addressed with technical methods, numerical models, treated as matters of efficiency, performance and, despite the evidence against it, predictability.

Hajer's ideal is of a reflexive, democratic process of deliberate social choice out of alternative scenarios of development, or of course non-development. How do we define and what constitutes the problem and solution of flooding and development on floodplains? In Hajer's model, sustainable integrated management would not be a primarily techno-administrative affair whereby the so called "objective reality of expert discourse" determines the problem and the solutions selected that are aligned with that "implicit social order of expert discourse" (Hajer, p281). A reflexive sustainable

integrated water management process would stand “face to face with the familiar techno-corporatist regime”, and foster a policy domain which determines “which actions should be taken, which social practices are to be respected”, and notably, “which conventions or practices should be changed” (*ibid*, p281). Beck (1986) also insisted on creating liberating practices based on reason and mutual respect. This awareness would facilitate a new creativity in thinking about and resolving floodplain restoration, which is more a “process of deliberation, shared problem solving and developing regimes of joint responsibility than merely interest-based bargaining” (Hajer and Wagenaar, p11). This is what Hannah Arendt calls ‘communities of action’, that are able to arrive at shared problem definitions and to agree on common paths of problem resolution (*ibid*, 2003). New political practices will need to be invented, importantly in a format that generates trust amongst the new interdependent actors (*ibid*). Wagenaar and Hajer (2003) observe that trust is made by active participation in collective action and problem solving and the range of ‘interactive’, ‘consensus building’ and ‘round table’ practices that have emerged in the context of the network society, where people generate new identities to prove of great value for generating instrumental solutions for policy problems.

Whereas this might sound ‘wishy washy’ to engineers, a promising change in engineering discourse from best practice overseas is aligned with Hajer’s reflexive, democratic approach. Novotny *et al.* (2010) state new transdisciplinary understanding of urban change and sustainability is required “to organise and integrate diverse perspectives and fields of knowledge, to explicitly address sustainability goals and to integrate strategies to build resilience capacity” (Novotny *et al.* 2010, p136). They define transdisciplinarity as the systematic, significant and reciprocal involvement of experts, professionals, decision makers and stakeholders. The transdisciplinary effort is seen to involve decision makers, scientists, planning and design professionals (including civil engineering, architecture, landscape architecture, and urban planning) (Kato and Ahern, 2008 in Novotny *et al.*, 2010). As engineers, Novotny *et al.* (2010) recognise that an urban plan is fundamentally different from a research project, policies that are implemented will influence residents and stakeholders. They view the process of ‘mutual learning’ as a participatory process involving non-expert public officials, local residents and special interest groups that leads to: goal determination; integration of local knowledge, perceptions, and values; evaluation of alternatives; and ultimately implementation, monitoring and management. Although transdisciplinarity and collaboration is the main-

stay of planning in England, this is an innovation for water managers.

Back to the political scientists, Hajer and Wagenaar (2003), who do not have any naive or idealised theoretical constructs in their mind's eye, warning that the creation of any hope or expectation from the formation of new professional forums can be misplaced. New 'argumentative' institutional structures can be extraordinarily time-consuming and expensive, they do not necessarily lead to consensus on environmental issues, and can actually lead to dissensus as actors lock into antagonistic discursive formats. As Fischer (2003) states, what many of us will have observed; "no amount of data, regardless of how well tested and verified it might be, will convince a person that anything important or useful has been presented if, in his or her view, the findings lead to policy judgements that take him or her in the wrong direction, or at least down a road he or she is unwilling to travel" (p112). If a policy actor has a hard-nosed opinion, then whatever the findings, they will not be viewed in a positive light and might even be as likely to harden their position versus the desired effect of triggering a new reflective process that leads to change (*ibid*). Where deliberative processes do fail, Fischer's insight could be used to advantage; to align and compromise with technological and rational discourses.

Adaptive Compromise – A New Model Army

Ward (2010) has identified a current paradigm shift occurring within the engineering discipline; a transition towards a more stakeholder based perspective. Engineers have recently begun to consider the 'Philosophy of Engineering', to reflect upon what engineering is, what engineers do and how their work impacts society (McCarthy, 2006 in Ward, 2010). Ward quotes the historic Royal Charter of the Institution of Civil Engineers (1828), which described the role of the engineer as: "harnessing the great forces in nature for the use and convenience of Man", the perspective of which has more recently been recognised as being outdated. The new outlook considers engineering as a socio-technical discipline for which traditional mathematical or physical modelling may not provide all the knowledge required to assess a system in terms of its impact on people (Royal Academy of Engineering, 2004 in Ward, 2010).

This paradigm shift has been observed in the research, a shift in the engineer's discourse has been noted. Nevertheless, engineers are split in two camps, and to date one of the

most oft quoted challenges and ‘barriers’ to floodplain restoration is a lack of empirical evidence of its effectiveness of a given intervention or the specific parameters required in a specific location and landscape context (Novotny, *et al.*, 2010). Floodplain restoration is considered a “*complex natural process*” in which the “*science underpinning the measures is incomplete*” (B2/05, Defra Engineer), with “*big data gaps*” (I1/09, EA Geomorphologist) and “*the misunderstanding of what can and cannot be done, hinders a holistic approach*” (*ibid*). This despite the growing scientific knowledge on the functioning of floodplains ecosystems and the regulation of rivers, since the mid 1980’s international scientific communities of ecologists, biologists, hydrologists and geomorphologists have made huge advances in our understandings of how rivers work and how they interact with their floodplains, as can be witnessed through chapters 5 and 6. Yet, it is questioned if the “*amount of uncertainty [is] leading to such woolly policy and a lack of commitment to action?*” (I2/09 Private Sector, Geographer). The innovative discourse coalition are indecisive in institutionalising the novel policy arrangement, constrained by engineering discourses “*we haven’t fully developed the tools, but what we do know is the mess we’re in. We need to get started and need to do more monitoring of projects, but we haven’t got the funding*” (G13/10, Rivers Trust Geomorphologist); “*there is still a need for catchment scale research – to improve the evidence base, and the applicability of schemes to another catchment*” (A3/09, Consultant Geographer) and “*innovation in water management is limited by lack of data to allow fair comparisons, giving a strong bias towards ‘tried and tested’ solutions*” (G14/10, CPRE). Yet two isolated voices in the research declared that “*the problem is we think it’s an engineering problem! We are looking at the problem in the wrong way*” (D08/10, Consultant ecologist) and “*too many people have forgotten that life is not engineering, you can’t model ecology. There are so many stresses, so many interactions, you can’t model everything!*” (D07/10, Academic Geographer).

Despite exercising ‘knowledge as power’ over the policy arrangement, indeed engineers and hydrologists themselves recognise the lack of precision in modelling capabilities: “*using commercial modelling software, plus or minus 40% is an accepted tolerance*” (A5/12, Consultant Engineer) and admitting that for hydraulic modelling, “*we know the answer [from actual flood event data] and we force the model to fit. It sounds like cheating? Well that’s normal hydrological practice!*” (E13/10, Academic Hydrologist).

Novotny *et al* (2010) provide an alternative strategy of ‘adaptive planning’. Whereas the traditional approach of earlier centuries was developed around the confidence “that

nature functions according to known rules, or laws, and that by understanding these laws and rules, human beings could manage or control nature, and consequently would prosper and thrive”. This deterministic conception of nature needs to be thrown out for the novel approach, whereby nature and natural-cultural systems are seen as inherently variable, uncertain, and prone to unpredictable change. Under an adaptive approach, plans and policies can be developed in the face of uncertainty and incomplete knowledge as they are based on the “best available knowledge, structured as experiments and monitored to learn how the actions result in specific goals, in terms of measurable functions” (p155). Under these new experimental designs and applications “there can never be complete knowledge, because every process is subject to disturbance and unpredictable change over time” (p155). Novotny *et al* (2010) recommend the routine practice of experimental applications and designs which have the profound potential to build empirical knowledge. They recognise that many scientists are reluctant make the ‘leaps of faith’ that are essential to conceive spatial concepts and that there is a need for a culture change to innovate and the “willingness to accept (small) failures as a consequence of experiments that can also yield great innovations and new knowledge” (p155). Planning policy can be seen as a hypothesis, that through implementation of the hydrologist’s implementation and monitoring, based on the best current knowledge available becomes “an experiment from which experts, professionals, and decision makers may gain new knowledge through monitoring and analysis (Novotny *et al*, 2010, p157). In this way the ‘problem’ of making a decision with imperfect knowledge becomes re-conceptualised as an ‘opportunity’ for a field experiment or ‘learn by doing’ from which new knowledge and innovations may be generated (*ibid*). To reduce risks, innovations can be ‘piloted’ as ‘safe-to-fail’ experiments (Lister, 2007 in Novotny *et al*, 2010). Adaptive management and resilience, Novotny *et al* (2010) reflect, has been researched and practiced successfully in natural resource management for decades but to date its application to the context of urban planning and design is rare (Kato and Ahern, 2008; Walker and Salt, 2006 in Novotny *et al*, 2010). In this way, engineers meet their need for monitoring and analysis.

The sustainability discussion can prove frustratingly ‘abstract’, to problem solving engineers. Novotny *et al* (2010) seek to move this abstractedness towards the use of scenarios and spatial concepts with clear imagery to both inform and stimulate the discussion of planning goals and strategies. Through specific mappable-spatial solutions

and site-scale urban design, concepts, goals, resource assessments, together with the designer's creative insight form the basis to physical form (*ibid*). Green infrastructure practitioners have arguably already surmised that alliances with both engineering and economic rationalities are necessary. If the common understanding of 'infrastructure' as a fundamental and essential support organised and managed to make something function, then Novotny *et al* (2010) postulate that if "the 21st-century world is to function in a more sustainable manner, green infrastructure will arguably play a central role" (p159). Green infrastructure is a relatively new, and still evolving, urban planning and design concept, used in relation to landscapes and physical systems that support the provision of ecological and environmental processes and services (*ibid*). Benedict and McMahon (2006, p1) define green infrastructure as "an interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife." In relation to the built/urban environment, green infrastructure addresses sustainability and resilience in the development process, and delivers quantifiable ecosystem services and benefits that are considered fundamental by Novotny *et al* (2010) to the sustainable city. International innovative engineers can find ecosystem services useable for 'goals' of sustainability planning, due to them being explicit, and important in an engineering context, "they can be scientifically measured and analysed and discussed in a transdisciplinary process" and in further engineering speak, they "represent the 'process' side of the 'pattern-process' dynamic; they can be explicitly 'mapped' with geographic information system (GIS) models and algorithms" and also "serve well as assessment metrics linking urban form (pattern) with urban process (ecosystem services), to support an informed discussion of goals and their associated spatial requirements and consequences" (Novotny *et al*, p143). In a transdisciplinary process, once quantified and mapped, ecosystem services can "logically become the goals and benchmarks of progressive urban sustainability planning" (*ibid*, p143).

Policy Diffusion

Although policy is influenced by the political, economic, societal and institutional characteristics of a nation state, the increasing globalisation of communication through international organisations, trans-national advocacy networks and international conferences, means new approaches and best practice, institutional innovations and

policy outputs spread internationally, in a process known as ‘policy diffusion’ (Warner *et al.*, 2012). Urban sustainability planning and design is evolving rapidly at a global and transdisciplinary scale through theoretical research, innovative urban policies and pilot or demonstration projects that test the new approaches and promote innovation (Novotny *et al.*, 2010). There are now many international examples, including urban retrofit projects, brownfield restoration projects, low impact new development and ecocities where urban planning and design has played a key role in innovative, more holistic systems to preserve, protect, restore and reuse the full spectrum of water uses that cities depend on (*ibid*). If we consider that in the 21st century, we need to replace and rebuild much of the infrastructure of the developed world, plus provide more infrastructure for the rapidly expanding cities of the developing world this Novotny *et al.* (2010) feel represents an “unprecedented opportunity to redirect and reconceive the process of urbanisation from one that is inherently destructive to one that is sustainable in specific terms” (p137). Yet in the mainstream practice of England, planners and designers only think defensively about avoiding or minimizing impacts related to development, and as Novotny *et al.*, 2010 note, in this case the “target is lowered, actions become conservative, and the possibility to innovate is greatly diminished” (p137).

A transition in modern water management from technocratic towards greater adaptivity, living with water, is a new approach in the Netherlands, accompanied by a new trend towards more collaboration between public, private and societal actors in interactive governance processes (*ibid*). The dominant position of the water authorities has been weakened by interest groups and a greater role for Dutch citizens, provinces and municipalities in water management (*ibid*). Chapter 1 details the UK government following the Dutch (and US) into a major flood defence strategy, following the East Coast flood of 1953. The Dutch response through the following decades was based on a philosophy of realising strong boundaries between water and land; a battle against water with streamlining of rivers, canalisation etc. (Wiering and Crabbé, 2006), as per England. The Dutch reached the ‘ecological turn’ in the discourse on water management in the 1980s (Disco, 2002), whilst the diffusion of ideas would appear to have reached the UK by the 1990s. If we are to follow the acknowledged experts in water management for a third time, then recent innovations are also promising for a flow of discourse across the channel.

8.3 Dissemination and Future Avenues of Research

Silverman (1993) observed that qualitative researchers ‘still’ had limited success in convincing policy makers of the relevance of their findings. Throgmorton (1991) emphasises that the postpositivist analyst, must mediate between three separate interpretive or epistemic communities; the scientific community, the political or policy decision-makers and the public. As Sarah Ward (2010) (geographer turned engineer) observes in her PhD impact plan, often academic research is only disseminated at the academic level, which although useful for disciplinary paradigm-shifts, for tangible societal impacts to be felt, then wider dissemination of findings and recommendations are necessary. I would also add the three broad but separated communities to my dissemination plan; planners, engineers and natural scientists, who each speak different languages that are not necessarily understood across the other communities. Hence, the PhD findings will be disseminated across the disciplines and across academia, policy making and practitioners. These prescriptions are designed to help those involved in the flood risk management field develop policy alternatives that are not pre-defined and shaped by entrenched interests, or to step around those interests. Through the political insight gained through the PhD into the discursive processes of policy definition, the emphasis for myself is to move forward as a ‘democratic facilitator’ (Fischer, 2003), across the ‘discourse coalitions’. Fischer (2003) sees what he terms ‘policy epistemics’ as helping us better understanding the ways in which various actors react to the scientific uncertainties that plague various policy arenas. He believes this holds the possibility of finding ways around the stand-offs that are characteristic of ‘intractable’ policy problems. Fischer (2003) states policy studies have almost totally neglected this epistemic translation involved in policymaking and have done so at a considerable cost. He directly attributes many of the important failures that we confront to this neglect. The main issue is to remove the dominant professional commitment to, and notably the trust in, the “superiority of technical rationalities and the hierarchical superior-subordinate practices that accompany them” (Fischer, 2003). The working through of ‘epistemic interconnections’ and their institutional implications, Fischer believes, should be placed at the top of the research agenda and should be posed as perhaps the major challenge involved in developing a more relevant mode of professional practice; “while policy epistemics might not offer us policy solutions per se, at least it could show us the ways to ‘keep the conversation going’” (Fischer, 2003, p232).

“Nowhere are the implications of such policy epistemics more important than in the contemporary policy curriculum” (Fischer, p232). Under the “dominant and outmoded conception of scientific epistemology”, Fischer states that social and policy sciences ill-equip their students, particularly doctoral students, for the world they are sent out to confront; “armed mainly with empirical research designs and statistical methods, many of them have little or no training to understand the normative and interpretive foundations of the tools they have learned to rely upon, or the social setting to which these techniques are to be applied” (p232). This could also apply across the academic curriculum for all disciplines involved in flood risk management. To enable engineers to understand the limits of their hydrological models? For planners particularly to understand the limits of ‘sustainable’ policy making and environmental regulation, to promote a richer approach to planning policy making, the interdisciplinary understanding required and their role as ‘reflective practitioner’ in water management?

Just Common Sense?

Passing over the fact that I had to look up the definition of ‘obfuscating’⁶, the headline quote of this concluding chapter reflected my concern that the thesis’ findings and recommendations amounted to little more than common sense – that we should talk to each other more? Silverman (1993) addresses this concern, quoting Wittengenstein “the aspects of things that are most important for us are hidden because of their simplicity and familiarity” (Wittengenstein, 1968 in Silverman, 1993, p184). Silverman thinks it strange that what we are concerned about within social science is essentially what is closest to hand, but “because it is so close to hand, both participants and researchers may often forget about it” (p185). Silverman notes that we use our common sense knowledge about the way in which the world is organised all the time to understand our research findings as well as in everyday life, “but rarely do we topicalise that common sense knowledge” (*ibid*, p185). Luker (2008) states, “Sometimes I ask my graduate students what the difference is between sociology and journalism. In fact, I share with them the mean joke that people sometimes tell, about sociologists just being just slow journalists.....My students almost always have a hard time with this question because

⁶ Definition – (ironically) - to make so confused or opaque as to be difficult to perceive or understand, to perplex or bewilder <http://www.thefreedictionary.com/obfuscating>

although they intuitively know that there is difference, they can't quite put their finger on it.....Journalists tell us the who, what, where, and when, but only sociologists tell us the why. And only sociologists (or social scientists more broadly) come equipped with a body of theoryA body of theory or theories enables one to test various versions of why things happen the way that they do, and to choose the most robust one" (p56). To date, I have not personally encountered the oft quoted conflict with positivist researchers or empiricists, instead the research has been merely 'positively' received in conferences, workshops (see appendix 1) and in general communication across the disciplines. If I were to be challenged that the thesis is merely common sense, then it could be advised that the reading of this thesis could alternatively be slanted to conclude that basic common sense practices are not being attended to in the policy processes of flood risk management.

Recommended Avenues of Further Research and Collaboration

The PhD has highlighted several avenues of social science related enquiry, of potential interest for ESRC funded research, for which either time constraints or the conceptual boundaries of the research restricted fulfilment. These are as follows:

Floodplain Restoration in Wales - The thesis commenced with a view to undertake a comparative case study, England and Wales. The decision was taken during the 'write-up' period, that the Welsh case study moved along parallel tracks until 1998 (until devolution of the Welsh Government), offered little comparative insight and thus incorporation of details of the Welsh case distracted from the strong chronological story line developing on English floodplains, the political rhetoric emanating from the Coalition government and seismic shifts taking place in the English planning system. However, recently John Griffiths Minister for Environment and Sustainable Development (and notably, former Deputy Minister for Economic Development) has presided over two recent studies; 1) a research report on 'Planning for Sustainable Economic Renewal' (2010) commissioned to evaluate the effectiveness of existing planning policy for economic development, and to scope future planning policy and guidance requirement (authored by economists, Roger Tym & Partners) and 2) a report from an Independent Advisory Group (September, 2012), chaired by the former Director of the Planning Inspectorate in Wales, on the future delivery of planning

services in Wales. The latter felt “instinctively that the principles of a democratically managed, plan-led system of development control established in 1947 had stood the test of time. This was supported in the evidence given to us; nobody suggested the system needed replacing. Our recommendations therefore seek to improve and adapt the system so that, to paraphrase the task given by the Minister, it delivers better”. In a speech to the RTPI Wales National Conference (2012), Griffiths stated sustainable development was built on three legs, and ‘economics’ was a shorter leg, he thus wanted ‘delivery’ to become the watch word of planners (A11/8). Furthermore three organisations, Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales, have been brought together as one organisation in 2012 – Natural Resources Wales; “looking to streamline environmental legislation and make it compatible with planning” (ibid). Further comparative research is thus recommended between the English ‘battle scene’ on the floodplains, with the discourses emerging in Wales.

Economic Growth, Housing and English Floodplains – In analysing the discourse of the Environment Agency, it would appear they prefer to be perceived as being in control of planning and development. A cursory analysis of planning statistics has revealed the percentage of floodplain restoration has remained largely constant, and many planning decisions remain unreported to the EA following the Agency’s objection. As noted by those observed in the policy domain, ‘*Floodplains and green belt seem to be most desirable places to build – with Barrett box dreams*’; this is ‘*an obvious tension for policy makers - reuse of brownfield sites. Needs understanding to arrive at an optimum*’ (Engineer). Francis Hesketh (TEP) in kindly reading the draft thesis, noted the early policy response of Oxford and Surrey planning authorities (chapter 4); “*It also occurs to me that many strategic planning decisions were influenced rather more by the totemic value of protecting ‘the Greenbelt’ than the less interesting but more functional value of maintaining floodplains.* Further research is thus recommended on tracing and examining the unreported decisions, what process has been undertaken to reach the decision to develop on floodplains, and who is really in the position of ‘power’ over continuing encroachment? The construction industry? The Treasury? Can blue belts replace greenbelts?

Ecosystem Services and Green/Blue Infrastructure - New approaches to ‘integrated’ water resource management obviously challenge both planners and water managers to work

within the natural water system, rather than disrupt it in ways that are ultimately unsustainable. Amelioration of the policy implementation deficit will, in particular, require the recognition of persisting power structures within agencies founded on technological and economic rationalities, to permit new partnerships to share responsibility and find new ways of working across sectors and disciplines towards sustainable, water sensitive towns and cities. Taking the assertion of Novotny *et al* (2010) that if “the 21st-century world is to function in a more sustainable manner, green infrastructure will arguably play a central role” (see p231), further case study research should be undertaken on the emerging work of GI Water Management Partnerships, for example the Defra Total Environment Pilot ‘Northwich and Winsford’⁷. GI functions/ecosystem services can be quantified and explicitly mapped with geographic information system (GIS) to support an informed discussion of specific natural flood risk management interventions, their spatial requirements and hydrological consequences. As such, do green infrastructure and paid ecosystem services offer the concept and tool for forming discursive alliances (and compromises) between ecological, planning, engineering and economic rationalities, to support successful operational planning frameworks?

Other Environmental Policy Arenas, including Coastal Re-alignment - Cryer (2006) states that one of the safest and most common outcomes of a research degree is a set of findings which are well substantiated through investigation and argument, and which are generalisable from one situation to another. Whilst concentrating on floodplain restoration, other similar ‘power plays’, political rhetoric, intractable policy implementation deficits have been observed to which institutionalism and discourse analysis could usefully be applied. The turn in the discourse towards Nuclear Power, for example, the ‘black-boxing’ of radioactive waste, the alignment of economic interests with the strong ‘low carbon’ climate change mitigation discourse? Closer to the restoration of fluvial floodplains, is the realignment of coastal ‘flood defences’ and what would appear to be a similar stand off between coastal geomorphologists, coastal defence engineers and planners – continued development in areas at risk of coastal flooding, ‘protected’ behind coastal flood defences.

⁷ The Mersey Forest, University of Liverpool/Waterco Knowledge Transfer Partnership, Environment Agency, Cheshire West and Chester District Council
<https://www.gov.uk/government/publications/total-environment-progress-report>

The above research is notwithstanding that the closure of the thesis, end of September 2012, coincides with the “*most intense storm in 30 years*” (BBC News, 2012), “*Emergency services fear further breaches of flood defences following days of heavy rainfall..... Scientists have been warning us for years that a warmer planet would lead to more extreme weather, and now it's arrived....tackling the climate crisis helps, not damages, our economic security and prosperity. Both crises are interlinked and must be tackled together*” (The Guardian, 2012). Proceeding with the same vein of research, an analysis of the continuing ebb and flow of the flood risk management discourses, is thus considered of continued value. Meanwhile, to permit one of the natural scientist’s ‘voices’ from the PhD research end the thesis with a note of cautious optimism, being sure Dr. Mark Everard from the Environment Agency will not mind if his anonymity is unveiled:

“From the top level, yesterday wasn’t right.....we don’t know the answers because we haven’t been there yet, but the future is in our hands to join things up in a sustainable way.”

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Appendix 1:

Publications and Conference Papers

Publications:

Potter, K. (2012) Finding ‘Space for Water’: Crossing Concrete Policy Thresholds in England, in Warner, J. F., Van Buuren, A. and Edelenbos, J. (eds.) Making Space for the River, Experiences with Multi-functional River Planning in the US and Europe, IWA Publishing, London.

Potter, K., Ward, S., Shaw, D., MacDonald, N., White, I., Fischer, T. B., Butler, D. and Kellagher, R. (2011), Engineers and planners – the role of partnerships in pursuing sustainable water management objectives, Engineering Sustainability, ICE.

Potter, K. (2010) Balancing Risk Factors in Floods Role, Planning, 14 May 2010.

Macdonald, N., Potter, K. & Ward, S., (2010) Hydrology and Spatial Planning, British Hydrological Society: Proceedings of the Third International Symposium, University of Newcastle, July 2010, 659-662.

Potter, K. (2009) Spatial Planning and Floodplain Restoration – In the Pitts? Proceedings of the 10th Annual RRC Network Conference, University of Nottingham, 21-26.

Potter, K. (2008) Planning Space for Water, Sustainable Hydrology for the 21st Century, Proceedings of the 10th BHS National Hydrology Symposium, University of Exeter, 341-345.

Potter, K. (2008) Turquoise is the New Green – Planning Space for Water, Proceedings of the UK-Ireland Planning Research Conference, Sustainability, Space and Social Justice, University of Belfast.

Potter, K. (2008), Turquoise is the New Green. River Restoration News, Issue 29, 4-5.

Conference Presentations:

Spatial Planning and Flood Risk Management, Green Infrastructure NW Regional Forum, Mersey Forest Risley Moss, April 2012 (invited).

Spatial Planning and Flood Risk Management, Liverpool Green Infrastructure Meeting, University of Liverpool, March 2012 (invited).

RTPI North West CPD Event, Resource Conscious Planning including Water Resources, University of Liverpool, September 2012 (invited).

Achieving Integrated Partnership Working in Urban Water Management, Cities of the Future – Sustainable Planning and Water Management, Stockholm, May 2011 (with Ward, S., Centre for Water Systems, College of Engineering, Mathematics and Physical Sciences, University of Exeter).

Floodplain Restoration – From Policy Rhetoric to Mainstream Practice? Neoliberal Policy Agendas and the Changing Nature of Flood Risk Management, University of Hull, Sept 2010.

Flood Risk Assessments – Considering Climate Change, Climate Change and Impact Assessment Conference, Met Office, Exeter, Oct 2009.

Slow Infiltration at Disciplinary Boundaries: Hydrology and Spatial Planning in the Urban Environment, British Hydrology Society/CIWEM Regional Meeting, Urban Hydrology, University of Exeter, July 2009.

Spatial Planning and Floodplain Restoration – In the Pitts? River Restoration Centre Annual Conference, Nottingham, April 2009.

Integrating Spatial Planning and Natural Flood Defences, Royal Geographical Society Annual International Conference, London, August 2008.

Planning and Flooding, Planning Aid Wales Regional Meeting, Bangor, October 2008.

Planning Space for Water, BHS National Hydrology Symposium, Exeter, Aug 2008.

Where's the Space for Water? How Floodplain Restoration Projects Succeed, Nature Orientated Flood Prevention International Conference, Darmstadt, April 2008.

Turquoise is the New Green – The UK/Ireland Planning Research Conference, Belfast, March 2008.

Strategic Partnerships in River Corridors Technical Seminar, Denmark, September 2007.

Appendix 2: Co-Convened Meetings



National Meeting

Bridging Troubled Waters - Hydrology and Spatial Planning

Thursday 14 January 2010, University of Liverpool

Programme

- 10:00-10:30 *Tea and Coffee on Arrival*
- 10:30 Introduction by **David Butler** and **Dave Shaw** – *Setting the Scene to 'Bridging Troubled Waters'* (Engineering, University of Exeter & Civic Design, University of Liverpool)
- 11:05 **Matt Ellis** *Hydrology and Planning – the Policy Perspective*
(Environment Agency)
- 11:40 **Dave Bayliss** *Surface Water Management – Achieving Common Objectives*
(Dwr Cymru Welsh Water)
- 12:15 **Francis Hesketh** *Water and Planning – Case Studies*
(TEP)
- 12:45-13:30 *Lunch*
- 13:30 **Iain White** *Planning and Hydrology – 'moving towards resilience'*
(University of Manchester)
- 14:05 Richard Kellagher *Emerging Challenges*
(HR Wallingford)
- 14.40 **Focus Group Break Out Sessions - Chaired by Presenters and other Experts**
(Reconvening at 15:30 for a summary of the group discussions)*
- 16:00 Facilitated Discussion – *the Way Ahead for Future Interdisciplinary Research, Policy and Practice* by **David Butler** and **Dave Shaw**
- 16:20 Meeting Closure

Conveners:

Neil Macdonald¹, Karen Potter¹ and Sarah Ward²

(1) School of Environmental Sciences, University of Liverpool, Liverpool, L69 7ZT

(2) School of Engineering, Computing and Mathematics, University of Exeter, Exeter, EX4 4QF

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Bridging Troubled Waters - Hydrology and Spatial Planning

Thursday 14 January 2010, University of Liverpool

Delegate List - Affiliations

Matt Ellis	Environment Agency
Dave Bayliss	Welsh Water
Francis Hesketh	TPR
Dr Iain White	University of Manchester
Richard Kellagher	HR Wallingford Ltd
Dr Neil Macdonald	University of Liverpool
Karen Potter	University of Liverpool
Sarah Ward	University of Exeter
Hannah O'Callaghan	JBA Consulting
Professor David Lerner	University of Sheffield
John Tweed	Tweed Nuttall Warbuton
David Thresh	David Thresh Ltd
Dr Judith Stunell	JBA Consulting
Tim Pickering	Environment Agency
James Dalgleish	Rossendale Borough Council
Tracey Ashworth	Atkins Limited
Bob Massingham	St Helens MBC
Peter Jones	Waterco Ltd
Raffaella Whitehead	Waterco Ltd
Lorna Jackson	Wigan Investment Centre
Susan Holland	Planning Inspectorate
Elizabeth Hill	Planning Inspectorate
Alan Boyland	Planning Inspectorate
Peter Wilmers	NW Green Infrastructure Unit
Chris Isherwood	JBA Consulting
Matt Hemsworth	JBA Consulting
Charlotte Beattie	Wrexham County Borough Council
Tom Ferguson	The Mersey Forest
Katie Goode	Atkins Limited
Mike Stokes	Environment Agency
Beverley Todd	University of Liverpool
Dr Olivier Sykes	University of Liverpool
Professor Thomas Fischer	University of Liverpool
Professor Janet Hooke	University of Liverpool



RTPI

mediation of space - making of place

**UK Flood Risk Management
Teaching & Learning Network**



**Institute
of Water**

“Water and Planning: Crossing Boundaries and Bridging Gaps”

24th February 2012

Exhibition & Conference Centre, University of the West of England

A Joint Workshop Forum for the Changing Water and Planning Policy Arena across England and Wales

Programme

10:00-10:30	Registration & Coffee	
10:30-10:45	Welcome & Context Setting	Chair – Neville Rookes (WLGA)
10:45-11:15	The Water Manager's View	David Wilkes (CIWEM)
11:15-11:30	The Planner's View	James Hooker (RTPI & Welsh Government)
11:30-12:00	Surface Water Management	Phil Chatfield (Welsh Government)
12:00-12:30	Water White Paper	Chad Staddon (SWAN/UWE)
12:30-13:15	Lunch & Coffee	
13:15-14:00	Break Out Group – Choice 1	Facilitators: Sue Illman (Illman Young Landscape Design Ltd), Karen Potter (RTPI/Uni of Liverpool), Phil Chatfield (WG), Sarah Ward (CIWEM/Uni of Exeter), Chad Staddon (SWAN/UWE), Nevil Quinn (FRMT&LN/UWE), , Charlotte Beattie (RTPI/Wrexham CBC)
14:05-14:50	Break Out Group – Choice 2	
15:00-15:45	Plenary, Final Discussions & Chair's Closing Remarks	Chair, break out group facilitators & all

Delegate List

Harry	Adshead	Dwr Cymru Welsh Water
Heather	Barker	Environment Agency
Pauline	Barry	MWH
Charlotte	Beattie	Wrexham County Borough Council/RTPI
Chloe	Begg	University of Lancaster
Sarah	Bessell	Monmouthshire County Council
Roland	Billington	Swindon Borough Council
Donna	Bowhay	Rhondda Cynon Taf County Borough Council
Janet	Busby	Swindon Borough Council
Barbara	Carroll	Enfusion
Phil	Chatfield	EA
Stephen	Colegate	Local Government
Liz	Cornwell	Dwr Cymru Welsh Water
James	Couzens	Swindon Borough Council
Andrew	Cox	Atkins Limited
Richard	Critchley	NK
Daniel	Curtis	Environment Agency
Rhodri	Davies	Brecon Beacons National Park Authority
Lorna	Davis	DCWW
Liz	Dean	Rhondda Cynon Taf CBC
Jo	Diamond	Environment Agency
Ann	Elias	TraCC Mid Wales Transport Consortium
Norman	Fleming	Dwr Cymru Welsh Water
Chris	Fulton	Environment Agency
Ben	Gilpin	Gloucestershire County Council
Rupert	Grantham	Planning Inspectorate
Rick	Grosfils	Arup
Rosie	Halpin	Swindon Borough Council
Julian	Hatherall	Earth Systems
Julian	Hill	Welsh Water
Julian	Hill	Dwr Cymru Welsh Water
Paul	Hodgkiss	Waterco
Martin	Hooker	NK
James	Hooker	Welsh Government Planning Division
Wayne	Hope	Denbighshire County Council
Sue	Illman	Illman Young Landscape Design Limited
Matthew	Ince	Atkins Limited
Owen	Jones	Rhondda Cynon Taf County Council
Julian	Jones	Black & Veatch
Rachel	Jones	Monmouthshire
Peter	Jones	Waterco
Paul	Kemp	MWH
Nick	Lloyd	Bridgend County Borough Council
Michael	Lloyd	BV
Simon	Masters	Swindon Borough Council
Sarah	Middleton	Pembrokeshire Coast National Park Authority
Dave	Morris	Neath Port Talbot Council
Chris	Newton	University of Exeter
Andrew	Norris	Swindon Borough Council

Joanna	Orr	NK
Mr	Owen Struthers	Caerphilly County Borough Council
Jonathan	Parsons	Bridgend County Borough Council
Jeffrey	Penfold	IPC
John	Philip	Arup
Dean	Phillips	Dwr Cymru Welsh Water
Karen	Potter	University of Liverpool/RTPI
Lesley	Punter	RTPI
Nevil	Quinn	UWE/FRMT&LN
Clement	Rhidian	Dwr Cymru Welsh Water
Katherine	Salter	Neath Port Talbot Council
Dominic	Scott	DCWW
Chad	Staddon	UWE/SWAN
James	Strangis	Cardiff Council
Sara	Taylor	Bridgend County Borough Council
Sarah	Ward	University of Exeter/CIWEM
Celia	Way	Buro Happold
Jonathan	Wellstead	Cardiff Council
David	Wilkes	Arup/CIWEM President
Stuart	Williams	Cardiff Council
Matthew	Williams	Cardiff Council
Roisin	Willmott	RTPI Cymru
Gayle	Wootton	NK
Helen	Heggs	Turley Associates